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## Agriculture.

### IRRIGATION.

ECONOMIC AND PRACTICAL METHODS—No. 4.

By P. MAHONEY, Cooper's Plains.

#### QUANTITY OF WATER TO USE.

Irrigation, like other occupations, needs knowledge and judgment to meet with the best results. The essential means for success do not depend entirely upon water and good soil. Both these essentials might predominate, and yet failure is liable to be met with. The art of knowing how much, and when to apply the water, is most important, for too much water is as disastrous as too little. Water applied unnecessarily does not produce as good a result as when given at the right time. It is not necessary to have the ground always sodden in order to produce payable crops. Once the plant or crop becomes stunted for the want of water it cannot be recuperated by superfluous waterings, nor produce good results.

In establishing orchards, &c., great care should be exercised in seeing that only the necessary amount of water is supplied, for if the surface soil is always kept wet, the plant will produce shallow roots, which will, when the plant is in full bearing, take an enormous amount of water to keep it supplied with enough nourishment to mature the crop, especially through dry and hot weather. This can all be avoided by supplying only the required quantity when the plant is young, thus encouraging the plant to send roots downwards in search of moisture. In fact, it is good policy to force them to go down so that they will not be affected by the rays of the scorching sun on the surface soil during the summer months. When such precautions are taken in irrigating, the plants are much more liable to produce satisfactory crops, and are affected in a less degree by adverse weather conditions.

The over-watering of fodder crops is disastrous, for these become detrimental to stock in several ways. They scour the beast dreadfully. Chaff which is produced under irrigation, unless the crop (more especially lucerne) has been cautiously watered, is dangerous, and it is not wise to feed it to a valuable animal if it has been produced under such conditions, i.e., subjected to superfluous waterings, for such chaff is likely to produce much more dust than ordinary chaff, which through inhalation rests on their lungs and sometimes kills horses, but more often ruins them and so causing them to become short-winded. Enormous hay and grain crops are obtained on the River Murray flats (S.A.) after the flood waters subside, but such hay has proved to be dangerous, as it scours the beasts to utter weakness. Yet the heaviest crop (Lifter oats) that has been attained in the southern hemisphere has been grown under these conditions, which proves that quantity alone should not be the aim of the irrigator in the case of fodders, fruits, &c. Fruits which are grown under similar circumstances will not stand packing very well, and are bad shippers.

Lucerne hay which has been over-watered dries out brittle; consequently, during curing, it loses an enormous quantity of hay, much impairing the quality of the chaff.

(To be continued.)

## COTTON SEED FOR DISTRIBUTION.

That the cotton-growing industry is steadily increasing in Queensland since the Department of Agriculture undertook to assist intending growers by establishing a ginning plant in Brisbane, making a cash advance to farmers on all seed-cotton delivered at the ginnery, and undertaking, furthermore, to market the fibre on the owners' account, deducting only the actual cost of ginning, baling, and cartage, is apparent from the annual returns of cotton production since 1914, whilst the price paid to farmers for their seed-cotton has regularly risen, reaching, in 1918, a figure which amply repays them for their enterprise.

This is clearly shown by the Under Secretary for Agriculture in his last annual report in the following:—

COMPARATIVE STATEMENT OF COTTON CROPS, 1914-1918.

Year.	Total Received.	Lint.	Advance per Lb.	Price Paid for Lint per Lb.	Price Received by Farmers per Lb. of Raw Cotton.
	Lb.	Lb.	d.	s. d.	d.
1914 .. ..	9,455	2,794	1½	0 6	1·65
1915-16 .. ..	29,230	10,066	1¾	0 6·9	2·54
1917 .. ..	118,229	37,694	1¾	0 11	3·5807
1918 .. ..	166,458	54,280	2	1 1	4

The above figures show that the crop for 1918 amounted to eighteen times that of 1914. Should the area under this crop continue to thus largely extend, there will be, as heretofore, no difficulty in disposing, in Australia alone, of all the cotton which Queensland may produce for a long time to come, at a satisfactory price, judging by the keen competition of local and Southern buyers for the past crops.

To ensure the production of first-class cotton, free from disease or insect pests, the Department purchased a quantity of seed of the best varieties of Uplands cottons in the United States of America. This seed has been supplied gratis to intending growers, and the result has been that, independent of the good returns from this seed, no further importations will be needed.

For the coming season there is a good supply of guaranteed seed for distribution, and, as the best time for sowing in the South is from the latter end of August to October, applications for a supply of seed, stating the area intended to be planted, should be sent early to the Department. (*See advertisement on page xviii., "Q.A.J."*)

November is rather late for planting in Southern Queensland, but full crops have been gathered from November sowings in districts where frosts only occur late in June or July. The Department supplies seed at the rate of 10 lb. per acre, which is more than ample to allow for ungerminated seed and misses. Full information on the subject of the cultivation of the plant may be obtained from the Department. Applications for seed to be addressed to the Under Secretary, Department of Agriculture and Stock, Brisbane.

## PINEAPPLE CIDER.

Mr. R. W. Holloway, West Cairns, writes on this subject:—

"A few months ago I noticed in your paper that you would be pleased to receive suggestions, &c., from any of your readers that might be deemed useful or interesting, and so I was tempted to send you the following:—

"There are doubtless many people who from time to time have a surplus of pineapples which they do not know what to do with, and it occurred to me: 'Why not make pineapple cider?' I would point out this fact, that it realises 1s. 6d. per bottle in England, and the demand far exceeds the supply; in fact, it is seldom to be obtained, and what little there is comes from the West Indies (Jamaica, I believe). Apple cider only sells at from 4d. to 6d. per bottle, and at this price one would think it can scarcely pay to produce. The same kind of apparatus, such as the press, mats, fruit-slicing machine, &c., would do for either pines or apples, and if the manufacture were carried out on a fairly large scale it should pay well.

"The usual plan in England is for each farmer to hire the necessary paraphernalia for a few days, and pass it on to his neighbour. No doubt some of your readers will be fully cognisant of the details as practised in Somerset, Dorset, and Wiltshire."



## Poultry.

### REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, MARCH, 1919.

The following are the final scores for the 1918-19 competition, which ended on 31st March. A full report will be published later. The prizes were awarded as follows:—

#### LIGHT BREEDS.

General aggregate .. ..	.. ..	.. ..	G. W. Hindes .. ..	1st
			T. Fanning .. ..	2nd
			W. Becker .. ..	3rd
True to type aggregate .. ..	.. ..	.. ..	G. Hindes .. ..	1st
			T. Fanning .. ..	2nd
			W. Becker .. ..	3rd
Winter test .. ..	.. ..	.. ..	G. W. Hindes .. ..	1st
			G. Howard .. ..	2nd
			C. Knoblauch .. ..	3rd
Single test .. ..	.. ..	.. ..	G. W. Hindes .. ..	1st
			Dr. Jennings .. ..	2nd
			G. W. Hindes .. ..	3rd

#### HEAVY BREEDS.

General aggregate .. ..	.. ..	.. ..	R. Burns .. ..	1st
			W. Smith .. ..	2nd
			J. W. Macrae .. ..	3rd
True to type aggregate .. ..	.. ..	.. ..	R. Burns .. ..	1st
			W. Smith .. ..	2nd
			J. W. Macrae .. ..	3rd
Winter test .. ..	.. ..	.. ..	W. Smith .. ..	1st
			J. W. Macrae .. ..	2nd
			R. Burns .. ..	3rd
Single test .. ..	.. ..	.. ..	R. Burns .. ..	1st
			D. Fulton .. ..	2nd
			E. F. Dennis .. ..	3rd

In many cases individual birds and groups have put up scores higher than those of the winners, but as the eggs laid were below the standard required, viz., 24 oz. per dozen, they are ineligible for prizes. As this seems to affect so many of the highest layers, it would seem that breeders in their desire to obtain numbers are neglecting quality. It will be noted that Mr. W. Smith has been awarded prizes, although in the August report his average was given as under 2 oz. This average was based on the weight of eggs of four birds only, as two were not then laying. The eggs of these have been since weighed, and found to be full weight and over. The following are the individual records:—

Competitors.	Breed.	March.	Total.
LIGHT BREEDS.			
*Dixie Egg Plant .. ..	White Leghorns .. ..	98	1,573
*G. W. Hindes .. ..	Do. .. ..	119	1,526
*E. Chester .. ..	Do. .. ..	61	1,433
*T. Fanning .. ..	Do. .. ..	81	1,428
*W. Becker .. ..	Do. .. ..	94	1,386
*Mrs. L. Henderson .. ..	Do. .. ..	81	1,351
*W. Lyell .. ..	Do. .. ..	80	1,348
*Geo. Prince .. ..	Do. .. ..	82	1,347
*G. Howard .. ..	Do. .. ..	89	1,343
*C. P. Buchanan .. ..	Do. .. ..	59	1,343
*G. H. Turner .. ..	Do. .. ..	65	1,314
*E. A. Smith .. ..	Do. .. ..	75	1,310

EGG-LAYING COMPETITION—*continued.*

Competitors.	Breed.	March.	Total.
LIGHT BREEDS— <i>continued.</i>			
*Dr. E. C. Jennings ... ..	White Leghorns ...	67	1,304
*C. Knoblauch ... ..	Do. ... ..	89	1,282
*L. G. Innes ... ..	Do. ... ..	40	1,261
*Range Poultry Farm ... ..	Do. ... ..	67	1,254
*R. Holmes ... ..	Do. ... ..	63	1,250
*Quinn's Post Poultry Farm ... ..	Do. ... ..	72	1,245
*Thos. Taylor ... ..	Do. ... ..	82	1,245
*Oakland Poultry Farm ... ..	Do. ... ..	45	1,241
Mrs. L. F. Anderson ... ..	Do. ... ..	90	1,230
*O.K. Poultry Yards ... ..	Do. ... ..	54	1,196
*Mrs. A. T. Coomber ... ..	Do. ... ..	60	1,191
B. Caswell ... ..	Do. ... ..	62	1,188
H. Fraser ... ..	Do. ... ..	69	1,179
*Mrs. R. Hunter ... ..	Do. ... ..	80	1,178
J. J. Davies ... ..	Do. ... ..	59	1,176
*J. M. Manson ... ..	Do. ... ..	56	1,174
Geo. Trapp ... ..	Do. ... ..	92	1,157
*Homalayan Poultry Farm ... ..	Do. ... ..	33	1,140
*J. Zahl ... ..	Do. ... ..	80	1,126
Mrs. A. G. Kurth ... ..	Do. ... ..	52	1,111
H. B. Stephens ... ..	Do. ... ..	49	1,059
*C. Porter ... ..	Do. ... ..	52	1,058
Progressive Poultry Pens ... ..	Do. ... ..	74	1,055
S. Wilkinson ... ..	Do. ... ..	76	1,052
O. W. J. Whitman ... ..	Do. ... ..	47	1,040
B. Chester ... ..	Do. ... ..	81	1,041
Shaw and Stevenson ... ..	Black Leghorns ...	61	1,040
*T. B. Hawkins ... ..	White Leghorns ...	39	1,028
W. A. Wilson ... ..	Do. ... ..	80	1,010
H. F. Britten ... ..	Do. ... ..	61	1,009
G. Williams ... ..	Do. ... ..	56	994
*J. W. Newton ... ..	Do. ... ..	80	988
P. O. Oldham ... ..	Do. ... ..	34	980
R. T. G. Carey ... ..	Do. ... ..	47	936
A. W. Walker ... ..	Do. ... ..	58	936
HEAVY BREEDS.			
*Nobby Poultry Farm ... ..	Black Orpingtons ...	80	1,389
*D. Fulton ... ..	Do. ... ..	114	1,364
*R. Burns ... ..	Do. ... ..	80	1,283
*E. Morris ... ..	Do. ... ..	105	1,263
*Mars Poultry Farm ... ..	Do. ... ..	96	1,225
*A. E. Walters ... ..	Do. ... ..	72	1,220
*E. F. Dennis ... ..	Do. ... ..	86	1,218
W. H. Reilly ... ..	Chinese Langshans ...	99	1,199
*W. Smith ... ..	Black Orpingtons ...	106	1,195
T. Hindley ... ..	Do. ... ..	59	1,172
A. Shanks ... ..	Do. ... ..	79	1,141
E. M. Larsen ... ..	Do. ... ..	36	1,086
J. W. Macrae ... ..	Do. ... ..	41	1,058
T. W. Lutze ... ..	Do. ... ..	86	1,031
*F. A. Claussen ... ..	Rhode Island Reds ...	48	875
H. Puff ... ..	Do. ... ..	56	819
J. Fitzpatrick ... ..	Do. ... ..	44	818
W. J. Mee ... ..	Black Orpingtons ...	50	809
Totals ... ..	...	4,447	76,243

\* Indicates that the pen is engaged in the single hen test

## DETAILS OF SINGLE HEN PENS.

Competitors.	A.	B.	C.	D.	E.	F.	Total.
LIGHT BREEDS.							
Dixie Egg Plant ... ..	235	249	303	229	257	298	1,573
G. W. Hindes ... ..	292	244	237	262	253	238	1,526
E. Chester ... ..	261	220	232	259	245	216	1,433
T. Fanning ... ..	251	221	254	198	253	256	1,428
W. Becker ... ..	233	242	214	251	208	238	1,386
Mrs. Henderson ... ..	234	194	232	193	272	226	1,351
W. Lyell ... ..	222	241	243	212	220	210	1,348
Geo. Prince ... ..	207	249	205	245	221	220	1,347
G. Howard ... ..	220	212	238	257	198	218	1,348
C. P. Buchanan ... ..	195	223	242	224	222	236	1,342
G. H. Turner ... ..	168	147	259	228	297	220	1,314
E. A. Smith ... ..	211	253	198	221	222	205	1,310
Dr. Jennings ... ..	180	277	234	187	226	190	1,304
C. Knoblauch ... ..	239	210	232	202	178	221	1,282
L. G. Innes ... ..	220	224	302	132	154	229	1,261
Range Poultry Farm ... ..	167	241	194	227	219	206	1,254
R. Holmes ... ..	209	235	205	209	191	201	1,250
Quinn's Post Poultry Farm ... ..	259	207	192	142	241	204	1,245
Thos. Taylor ... ..	147	238	211	203	220	226	1,245
Oakland Poultry Farm ... ..	180	215	223	215	227	181	1,241
O.K. Poultry Yards ... ..	185	236	205	191	222	177	1,196
Mrs. Coomber ... ..	187	205	207	207	162	223	1,191
Mrs. R. Hunter ... ..	178	200	149	204	229	218	1,178
J. M. Manson ... ..	246	309	238	186	142	153	1,174
Homalayan Poultry Farm ... ..	228	184	184	146	210	188	1,140
J. Zahl ... ..	231	183	213	211	172	116	1,126
C. Porter ... ..	158	192	186	182	110	220	1,058
T. B. Hawkins ... ..	211	145	191	152	148	187	1,028
J. W. Newton ... ..	190	220	129	138	189	132	988
HEAVY BREEDS.							
Nobby Poultry Farm ... ..	281	240	224	130	260	254	1,359
D. Fulton ... ..	290	199	207	212	185	271	1,364
R. Burns ... ..	190	218	186	202	275	212	1,283
E. Morris ... ..	190	202	227	252	216	186	1,263
Mars Poultry Farm ... ..	215	223	198	205	184	200	1,225
A. E. Walters ... ..	179	222	159	231	220	209	1,220
E. F. Dennis ... ..	249	193	192	134	228	222	1,218
W. H. Reilly ... ..	197	215	219	178	170	220	1,199
W. Smith ... ..	266	198	164	193	167	207	1,195
J. W. Macrae ... ..	124	154	192	182	110	195	1,058
F. A. Claussen ... ..	151	151	164	146	148	115	875

## FINAL REPORT OF THE FIFTEENTH EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE.

The fifteenth egg-laying competition at the Queensland Agricultural College was concluded on the 31st of March, 1919. In all, 390 birds competed—150 in group pens, while the balance of 240 were single tested.

### WEATHER CONDITIONS.

More unfavourable weather could not have been experienced. The drought that prevailed throughout the competition was most trying to the birds, both as regards their health and the supply of necessary feed stuffs, which latter were often unprocureable owing to the hot, dry times.



## FEEDING.

The morning mash used throughout the contest was the same as that fed in former years, viz.—60 per cent. pollard, 30 per cent. bran, 5 per cent. Meggitt's linseed meal, and 3 to 7 per cent. dried blood. The above figures are about standard, but slight alterations were made when the quality of the mill offal varied. Altogether the quality of the food-stuffs has not been satisfactory. Sound wheat, the appearance of which has almost been forgotten, has been unprocurable, and, in its absence, the most had to be made out of cleaned weevil-eaten grain. The absence of green feed has been severely felt by the birds, very little of this important food being procurable.

## GENERAL RESULTS.

Taking into consideration the set-backs that the birds have had to experience, some of the results are remarkable. Throughout the year it has been nothing else but the survival of the fittest, and the general results point to the good stamina the birds must have possessed to carry on as they did. Whilst the contest was actually proceeding, it was necessary, owing to the transfer of the College poultry plant, to remove 270 of the competing birds, making set-back number one, and a big one at that, for it is the best proven method of checking laying. Some were moved at a critical time, when there was every possibility of moulting owing to the check. The second check was the absence of green feed. The want of this important food in a good season would have had a depressing effect, but being withheld in a dry time like the 1918-19 year, it is easily understood that the birds experienced a trying time, and that it was a matter of difficulty to keep them in good health. In view of this the results obtained are highly satisfactory and indicate that the majority of the birds possessed first-class stamina and quality. Some few pens—and it is pleasing to note there were not many of this class—did badly, but these would have been inferior no matter what conditions they had been kept under.

## RECORDS.

It is to be regretted that many fine performances were negatived by light weight eggs. Individual birds and several groups did excellently as regards number of eggs laid, but as the weight of egg was below the 2 oz. standard required, these birds and pens were ineligible for prizes, nor could they carry away with them the seal ring of performance. This failure to attain the required weight was especially noticeable among the Black Orpingtons. Among the light breeds, the performance of Mr. G. W. Hindes's pen "I" (the winner of the Light Breed competition) is to be highly commended. All who visited the pens agreed that this was the most typical pen in the competition, and they gained pride of place in the matter of trueness to type. But besides this, five out of the six birds laid eggs up to or above the standard. Further, each of the birds laid well, three passing the 250-egg mark, and the other three were close up. The uniformity of this pen, coupled with the high production and high quality, is a truly fine achievement for one breeder's yard. The pen of White Leghorns entered by the

Dixie Egg Plant deserves special comment. This pen laid a total of 579 eggs for the winter test, a world's record as regards numbers. Further, this pen laid the highest aggregate for the year, and each of the six birds was a consistent egg-producer. Unfortunately for such a successful breeder, not one of these birds laid eggs weighing up to the standard required. Three birds laid 300 eggs and over, viz.—Dixie Egg Plant's "C" bird (303) and "F" (300), and L. G. Innes's "C" bird (302). In these three cases the eggs were under weight, so that Mr. Hindes's "A" bird, with 292 to her credit, was awarded the prize for the highest individual score. As a case of continuance in laying, D. Fulton's "A" bird deserves mention. She laid 3 eggs in 4 days at the beginning of April, 1918, and then went off until the 5th of June, but since then has put up the remarkable score of 287 eggs in 301 days, putting up two big breaks of 70 from 20th July to 27th September, and 77 from 29th September to 14th December.

#### BROODINESS.

The number of broodies was not so large as in the preceding contest, although they were still plentiful. Very few cases were recorded in the Light Section. In the Heavy Section birds owned by the following breeders were very free from broodiness (in most cases only one bird in each of the respective pens giving trouble):—Nobby Poultry Farm, R. Burns, T. Hindley, A. Shanks, D. Fulton.

#### GROUP PENS.

One cannot help remarking upon the disadvantage of the group when compared with the single test system. Besides the fact that the latter gives the record of each bird, it is found that more judgment can be used in the feeding, as with groups there are always one or two shy feeders and odd gluttons in the pen, and although the feeding may be gone over twice, it is not satisfactory. Under the system of housing, as adopted at the College, whereby no scratching material is given, the birds in the single pens appear to tire of their own company and seem to move about more than those in the groups. This is of great benefit to them. If a bird in a single pen appears to be too high in condition, her allowance can be regulated; but in a group pen a bird inclined to go to condition has to receive all she will eat, or the remainder are deprived of a fair feed.

#### HEALTH OF STOCK.

Taking all things into consideration, the health of the birds has been good. In all there were twenty-six deaths. There were two cases of tuberculosis, six cases of ruptured internal organs, twisted bowels, broken blood vessels, or ovarian cases; two accidental deaths caused by a wind storm; while the remaining sixteen were due either to liver trouble, wasting, or going light, bowel and blood troubles, or inflammation of lungs. Towards the end of January the absence of greenstuff made itself very apparent, paleness of comb, poor feeding, and unhealthy droppings being very plentiful. A purge would have been of great assistance to those ailing, but to have given this generally throughout



the flock would have brought on a number of moults, which would have been undesirable. Thus, to combat the trouble, ailing birds had to receive individual treatment, and as far as possible this was carried out. Certainly some of the cases of sickness were due to weak stamina, and the chances of several of the pens were spoiled by their containing one or more birds of a bad constitution. But in a majority of cases illness was due to a shortage of greenstuff, thus withholding Nature's most effective blood and bowel rectifier. Under these circumstances, all birds which have been ill should not be condemned for breeding. However sound it may be, under normal conditions, to follow the practice of never breeding from a bird which has been ill, this seems scarcely just in the case of such an abnormal season as that of 1918-19.

#### GENERAL COMMENTS ON "TRUENESS TO TYPE," COMPETITION BIRDS.

*Light Breeds.*—The improvement in type of the birds competing in the current competition is small in comparison with the 1917-18 contest. In classifying the pens, the standard of the utility poultry breeders has not been strictly adhered to, and a good deal of leniency has been shown in connection with the English Poultry Club standards. There are a few pens of exceptional quality, and it is very gratifying to be able to say that these same pens have, in nearly every instance, given a satisfactory account of themselves. The type of the birds in the six-hen test, which are for the most part owned by beginners in competition work, is much better than the type of those owned by the majority of the old hands, and new men in the singles have in most cases forwarded good specimens. In our opinion, the pen owned by G. W. Hindes is almost ideal for utility work, and possesses every feature that marks them as Leghorns. They have size without coarseness, are very uniform, with typical Leghorn bodies, and perfect headpieces. They also possess stamina which no change in weather or conditions seems to shake. This, in our opinion, is half the battle in competition work. This same pen has passed the weight of egg test, and takes the third place for number of eggs produced. It is, therefore, plainly proved that close conformity to the English standard weight and number of eggs can be obtained by some breeders. It is therefore intended to adopt more stringent measures each year, allowing ample time for competitors to make the necessary improvements in their stock. The lack of uniformity in some of the pens spoils their whole appearance. Several pens are completely spoilt, and consequently graded lower, owing to one or two individuals being dwarfed. The Homalayan P. Farm's F bird in the single test is about the most typical bird in the competition, yet the pen is graded second class owing to the absence of uniformity. There are a goodly number of Leghorns with very diminutive combs. Taken for granted that the comb calls for a certain amount of upkeep, the larger it is the bigger the drain on the bird's system, a Leghorn without the neatly serrated, fine-textured comb hanging gracefully on one side has the appearance of anything other than a Leghorn, especially if the medium comb is in conjunction with small size or discoloured lobes. Tail-carriage in Leghorns has a tendency to alter the general outline of a bird. One possessing a "squirrel" tail usually carries its body more erect than one with the tail at an angle of 45 degrees to the back. These high-tailed, upright carriage birds always appear to be short backed, and always have an erect or semi-erect comb and rather long shanks. During the six months' duration of the present competition the weather has been most variable, and at times only birds possessing stamina could show a satisfactory advance in their totals. Owing to the judgment for trueness to type having been postponed till half the contest was finished, we are placed in a favourable position to observe the doings of the pens during trying weather conditions. There are, in our opinion, certain pens which their owners have had difficulties in rearing, and others that show every evidence of having been troubled with roup, catarrh, and other sickness in their early life. It is very often the case that a breeder has trouble with his young chickens, and at times has to treat them for various ailments; but as soon as these same birds redden up for laying and have that beautiful appearance that a pullet has when about to lay, in a large number of cases the owner forgets the bird's past life, thinks only of how she appears at the time for sending for competition work, and the way she was bred. These birds which have had early set-backs are soon picked out when the genuine hard work comes or the weather is trying. Some continue to lay moderately, but their drawn-in faces, anaemic combs, shrunken legs, overloaded tail appearance, poor appetites, and forlorn look give them away when the subject of stamina comes in. Stamina has had a great deal to do with the manner in which the birds are graded, for without it they cannot stand a year's heavy laying, and then be



expected to produce birds even better than themselves. Competitors who think they have been hardly dealt with in the classification can rest assured that one of the reasons for their being graded lower than their expectations is that the birds owned by them are showing the strain in too marked a degree. Owing to the scarcity of green feed, closely bred birds feel its absence and show it in their returns. The very hot weather, together with the absence of greenstuff, picks out and hastens the death of a number of birds possessing hereditary weaknesses and disease. It would be far better for a breeder to sacrifice a dozen or two eggs than to put up with the trouble and disappointment of rearing the present day usual run of weak constitutioned specimens. The heavy mortality in rearing is often the cause of the disheartening of a beginner.

*Heavy Breeds.*—We have gone to the expense of leniency in classifying the heavy breeds, which for the most part consist of Black Orpingtons. Not only have breeders to make a big improvement in type, but the size of the eggs and tendency to broodiness have to be amended. There is a very great variety of type amongst the Orpingtons. There are birds with short backs, roach backs, finny backs, and those with cushions resembling those of a present-day Cochin. These backs finish off with an assorted variety of tails. There are true Orpington tails, long tails, and spread tails. Breeders of exhibition Orpingtons know too well the difficulty of producing blacks with that much desired green sheen, so too strict attention has not been given to this feature when passing verdict in this section. The required points of an Orpington are much harder to obtain than those of a Leghorn; hence, as previously remarked, more leniency has been shown in classifying in this breed. Side spikes on single combs are in evidence in too many cases for one's liking: it is a defect which is transmitted. Birds having this fault will be placed in the 4th class in future competitions, and the same may be said of birds having feathers on their shanks in the clean-legged breeds. The combs on some of the Black Orpingtons are too large and hang to one side, so that if they possessed white lobes they would easily pass for a light breed. The build of some, with their long backs, tails, and legs, together with their fineness of bone, more resembles a light breed than a heavy one. The sooner the better it will be for all utility poultrymen when a thorough understanding is arrived at as to what constitutes the type, and the number of points to be allotted for each feature in all breeds for utility purposes, instead of one common standard as issued by the Utility Poultry Club. The severe task of classifying 400 birds, the majority of which possess any number from three to a dozen failings on comparing them with the original standard, is a task not to be envied. Often the remark is heard—"That's So-and-so's type of birds." It may mean that So-and-so's stock compare with the standard so favourably that they stand out from all others; or, on the other hand, that he has been adopting close breeding and has stamped a number of failings into his flock which are easily detected. Shape is half the breed, and features the other half. The writer of these notes once showed a Jubilee Orpington, rather long in back, as a Speckled Sussex in one of the leading young stock shows of England, and won first prize. The same bird won first and cup at the Crystal Palace in the Jubilee Orpington class, thus showing that too much was allowed for colour and not sufficient for shape. The evolution of the Orpington has been remarkable. The late Wm. Cook originated the breed, for one reason, for lovers of the Cochin who objected to the feathering on the legs; but it must be borne in mind that the Cochin of that date was not the mass of balls of fluff it is at the present day. The first Black Orpington that was shown was very clean in face, possessed good eyes, but was not the full-fronted bird of the present day. It possessed width, fair length of back, a moderate tail, and showed more daylight underneath than the show bird of to-day, which has the appearance of being related to the old Scotch Dumpie. In fact, the old time B.O. had the appearance of a robust, rather close feathered, better class utility Black of the present time.

The classification of the competing pens is as follows:—

Class I.—Have passed, having answered all requirements in trueness to type.

Class II.—Have passed, but have faults which need rectifying in future breeding. These faults will be found in the full detailed report given below.

Class III.—Possess faults which will pass them out in the next competition (1919-20). and the breeders must take drastic measures to improve same, otherwise they will not be accepted for future competition. This current competition will admit this class.

Class IV.—Altogether failing to comply with our requirements and consequently passed out.

#### *Detailed Comments on Light Section.*

G. W. Hindes (Class I.).—Nearest our ideal in the competition.

O.K.P. Farm (Class IV.).—B, D, and E too small. F side spikes.

Range P. Farm (Class II.).—Strong constitutions, variation in tail carriage.

L. G. Innes (Class II.).—Devoid of Leghorn headpieces, only just managed to get into this class.

Geo. Prince (Class III.).—B inclined to be wry-tailed.

C. Knoblauch (Class III.).—Lacking in stamina.

Oakland P. Farm (Class III.).—Tail carriage variable, assorted sizes and headpieces.

E. A. Smith (Class II.).—Lack uniformity, strong constitutions.

Geo. Howard (Class I.).—F a trifle small, good constitutions, D one of the most typical in competition.

T. Fanning (Class I.).—Robust, good doers, possessing size, and Leghorn characteristics, F a really fine specimen.

W. Lyell (Class II.).—An even, business-like pen, but could do with more size.

Dr. E. C. Jennings (Class IV.).—D and F very small, spoiling pen altogether, too high tail carriage and tails too erect, A, B, and C good bodies.

R. Holmes (Class II.).—Rather narrow, could do with more room behind in some cases, splendid open faces and fine textured combs.

T. B. Hawkins (Class II.).—C bird appears on the weak side.

G. H. Turner (Class III.).—C and E too small, E white in face, pen lacks uniformity.

Mrs. L. Henderson (Class I.).—Good bodies and tail carriage, neat heads.

Homalayan P. Farm (Class II.).—Very variable, B inclined to be weak, F bird an ideal specimen.

C. Porter (Class III.).—Splendid bodies, but all white in face.

C. P. Buchanan (Class II.).—Rather on fine side, but strong, good doers.

J. W. Newton (Class II.).—Largest in competition, too coarse in cases; headpieces away from requirements, being too large in some and rough textured in others.

Dixie Egg Plant (Class II.).—Not of the largest, D and E possess neat heads, the others having very small combs, rather fine in type, faults largely counteracted by stamina.

J. Zahl (Class IV.).—Lacking in stamina.

Mrs. R. Hunter (Class II.).—Heads trifle coarse; good size, shape, and bone; A and E have side spikes on comb.

W. Becker (Class III.).—Squirrel-tailed, C wry-tailed, combs too erect, only just managed this class.

E. Chester (Class III.).—Side spikes in evidence, lack size and substance, splendid constitutions.

Quinn's Post P. Farm (Class II.).—B bird too fine in bone, good bodies; F erect comb.

Mrs. A. T. Coomber (Class II.).—Size varies, C spoils pen, F very typical.

Thos. Taylor (Class II.).—B bird too fine, otherwise first-class pen.

J. M. Manson (Class II.).—Could be more uniform.

H. F. Britten (Class I.).—A very nice light-feathered pen, showing no weediness whatever.

G. Williams (Class II.).—On the narrow side and not too uniform.

A. W. Walker (Class I.).—A pen we like very much, being very typical and good doers, evidently were used to intensive housing before arrival at competition.

H. Fraser (Class III.).—Very mixed.

W. A. Wilson (Class II.).—One small bird spoils pen.

S. Wilkinson (Class IV.).—Too small and type very variable.

Mrs. L. F. Anderson (Class II.).—Lack uniformity.

E. Chester (Class II.).—Spoilt by variation in size.

Geo. Trapp (Class I.).—Splendid bodies and carriage.

R. T. G. Carey (Class IV.).—Type and size very uneven.

O. W. J. Whitman (Class III.).—Lacking in Stamina.

B. Caswell (Class I.).—Very even and good stamina, want just a little more size.

P. Oldham (Class I.).—Nice headpieces, slight variation in size, good bodies.

J. J. Davies (Class I.).—Good doers, a pleasing pen all through.

Shaw and Stevenson (Class I.).—A first-class pen for type, size, and colour. Constitutions good.

Mrs. A. G. Kurth (Class II.).—Rather coarse in heads, good bodies and stamina.

Progressive P. Pens (Class I.).—A front rank pen for size and shape. Another pen that has evidently been used to intensive work before entering competition.



*Heavy Breeds.*

J. W. Maerae (Class II.).—Good size, plenty of room, too much tail.

W. Smith (Class I.).—Nice and blocky, type of the best if compared with average utility Blacks of the present day.

F. A. Claussen (Class I.).—Good size and shape, colour passable on arrival in April, 1918.

D. Fulton (Class II.).—Type not consistent throughout, splendid eyes.

Nobby P. Farm (Class II.).—Very strong constitutions, roach backs and too tall on legs.

R. Burns (Class III.).—A big variation throughout in type and size.

E. Morris (Class III.).—Type not regular enough, those possessing shape are too small.

A. E. Walters (Class I.).—A very nice pen, taken all round, not so tall as the majority, headpieces very neat.

Mars P. Farm (Class II.).—Very neat heads, inclined to too much tail.

E. F. Dennis (Class IV.).—Type very variable, poor colour.

W. H. Reilly (Class II.).—Type and size not consistent, type of D bird approaching that of a modern Langshan.

E. M. Larsen (Class II.).—Good constitutions, and not so tall as a good many; could be more uniform.

J. Fitzpatrick (Class I.).—Good size and stamina, not the best of colour.

T. Hindley (Class II.).—First-class headpieces, too much tail, colour in some cases dull and devoid of sheen.

H. Puff (Class I.).—The pick of the R. I. Red pens; two birds in this pen are fit for show bench.

W. J. Mee (Class IV.).—Too small, and altogether away from standard.

A. Shanks (Class I.).—One of the best pens in the heavy section for colour and Orpington characteristics.

T. W. Lutze (Class II.).—Strong big-framed birds on the big side.

## WEIGHTS OF EGGS, SINGLE HEN PENS.

Competitor.	A.	B.	C.	D.	E.	F.	Group.
	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.
LIGHT BREEDS.							
G. W. Hindes .. .. .	2 $\frac{1}{4}$	1 $\frac{7}{8}$	2	2	2	2 $\frac{1}{4}$	2
O. K. P. Farm .. .. .	2 $\frac{1}{8}$	2	2 $\frac{1}{8}$	1 $\frac{7}{8}$	2	2	2
Range P. Farm .. .. .	..	2 $\frac{1}{4}$	1 $\frac{3}{8}$	2 $\frac{1}{8}$	1 $\frac{7}{8}$	2	2
L. G. Innes .. .. .	2	2	1 $\frac{7}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{4}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$
Geo. Prince .. .. .	1 $\frac{7}{8}$	1 $\frac{7}{8}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	2	1 $\frac{3}{4}$	1 $\frac{3}{4}$
C. Knoblauch .. .. .	2	2 $\frac{1}{8}$	1 $\frac{7}{8}$	2 $\frac{1}{4}$	1 $\frac{7}{8}$	2	2
Oakland P. Farm .. .. .	2 $\frac{1}{4}$	2	2	1 $\frac{3}{4}$	2	2 $\frac{1}{8}$	2
E. A. Smith .. .. .	2 $\frac{1}{8}$	2 $\frac{1}{8}$	1 $\frac{7}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	1 $\frac{7}{8}$	2
G. Howard .. .. .	2	2	2 $\frac{1}{4}$	2	2 $\frac{1}{8}$	2	2 $\frac{1}{8}$
T. Fanning .. .. .	2	..	1 $\frac{7}{8}$	2 $\frac{1}{4}$	2	2 $\frac{1}{4}$	2
R. Holmes .. .. .	2 $\frac{1}{8}$	2	1	2	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2
T. B. Hawkins .. .. .	2	2 $\frac{3}{8}$	2	2 $\frac{3}{8}$	1 $\frac{7}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$
G. H. Turner .. .. .	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2	1 $\frac{7}{8}$	1 $\frac{7}{8}$	2	2
Mrs. Henderson .. .. .	3	..	2 $\frac{1}{4}$	2	1 $\frac{7}{8}$	2 $\frac{1}{4}$	2
J. H. Wright .. .. .	2	2	2 $\frac{1}{4}$	2 $\frac{3}{8}$	2 $\frac{1}{8}$	2	2 $\frac{1}{8}$
C. Porter .. .. .	2 $\frac{1}{2}$	1 $\frac{3}{4}$	2 $\frac{1}{4}$	2	2	2	2
C. P. Buchanan .. .. .	1 $\frac{3}{8}$	2	2 $\frac{1}{8}$	2 $\frac{1}{8}$	1 $\frac{7}{8}$	1 $\frac{7}{8}$	2
J. W. Newton .. .. .	2 $\frac{1}{4}$	1 $\frac{7}{8}$	2	2	2 $\frac{1}{8}$	2 $\frac{3}{8}$	2 $\frac{1}{8}$
Dixie Egg Plant .. .. .	1 $\frac{7}{8}$	1 $\frac{6}{8}$	1 $\frac{7}{8}$	1 $\frac{7}{8}$	1 $\frac{7}{8}$	1 $\frac{3}{4}$	1 $\frac{7}{8}$
J. Zahl .. .. .	1 $\frac{6}{8}$	2	2	2 $\frac{1}{4}$	2	..	2
Mrs. R. Hunter .. .. .	2	1 $\frac{7}{8}$	2	2 $\frac{1}{8}$	1 $\frac{3}{4}$	2 $\frac{1}{8}$	2
W. Becker .. .. .	2	2	2	1 $\frac{3}{8}$	2	2 $\frac{1}{8}$	2
E. Chester .. .. .	1 $\frac{7}{8}$	1 $\frac{7}{8}$	2	1 $\frac{3}{4}$	1 $\frac{7}{8}$	2 $\frac{1}{4}$	1 $\frac{7}{8}$
Quinn's Post R.F. .. .. .	1 $\frac{7}{8}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	2 $\frac{1}{8}$	1 $\frac{3}{4}$	1 $\frac{7}{8}$	1 $\frac{7}{8}$
Mrs. Coomber .. .. .	2	1 $\frac{3}{4}$	2 $\frac{1}{8}$	2	2	2	2
Thos. Taylor .. .. .	2	2 $\frac{3}{8}$	2	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2	2
J. M. Manson .. .. .	1 $\frac{7}{8}$	1 $\frac{6}{8}$	2	1 $\frac{3}{8}$	2	1 $\frac{7}{8}$	1 $\frac{7}{8}$
Dr. Jennings .. .. .	2 $\frac{1}{4}$	2	2	1 $\frac{7}{8}$	2	2	2
W. Lyell .. .. .	1 $\frac{7}{8}$	2	1 $\frac{3}{4}$	1	2	1 $\frac{3}{4}$	1 $\frac{7}{8}$

WEIGHTS OF EGGS, SINGLE HEN PENS—*continued*.

Description.	A.	B.	C.	D.	E.	F.	Group.
	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.
HEAVY BREEDS.							
J. W. Macrae .. .. .	2 $\frac{1}{4}$	2	2	2	1 $\frac{3}{4}$	1 $\frac{7}{8}$	2
W. Smith .. .. .	1 $\frac{5}{8}$	2 $\frac{3}{8}$	2	..	..	1 $\frac{3}{4}$	1 $\frac{7}{8}$
F. A. Claussen .. .. .	1 $\frac{3}{4}$	1 $\frac{7}{8}$	2	2	2 $\frac{1}{8}$	1 $\frac{7}{8}$	1 $\frac{3}{4}$
W. H. Reilly .. .. .	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{7}{8}$	1 $\frac{5}{8}$	1 $\frac{5}{8}$	1 $\frac{3}{4}$
E. F. Dennis .. .. .	1 $\frac{5}{8}$	1 $\frac{5}{8}$	1	2	1 $\frac{5}{8}$	2	1 $\frac{3}{4}$
Mars P. Farm .. .. .	1 $\frac{7}{8}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{7}{8}$	1 $\frac{5}{8}$	1 $\frac{5}{8}$	1 $\frac{3}{4}$
A. E. Walters .. .. .	1 $\frac{7}{8}$	1 $\frac{7}{8}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{7}{8}$	1 $\frac{5}{8}$	1 $\frac{7}{8}$
E. Morris .. .. .	2	2	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{7}{8}$
R. Burns .. .. .	2 $\frac{1}{8}$	1 $\frac{7}{8}$	1 $\frac{7}{8}$	2	2	1 $\frac{7}{8}$	2
D. Fulton .. .. .	1 $\frac{7}{8}$	1 $\frac{3}{4}$	1	1 $\frac{7}{8}$	1 $\frac{3}{4}$	2	1 $\frac{7}{8}$
Nobby P. Farm .. .. .	1	1	1	1 $\frac{7}{8}$	1	1 $\frac{7}{8}$	1 $\frac{3}{4}$

## GROUP PENS.

	Average.	Variation.
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## LIGHT BREEDS.

H. F. Britten .. .. .	2 oz.	1 $\frac{3}{4}$ to 2 $\frac{1}{8}$ oz.
G. Williams .. .. .	2	1 $\frac{3}{4}$ to 2 $\frac{1}{4}$ "
A. W. Walker .. .. .	2 $\frac{1}{8}$ "	1 $\frac{7}{8}$ to 2 $\frac{1}{4}$ "
Harold Fraser .. .. .	1 $\frac{7}{8}$ "	1 $\frac{5}{8}$ to 2 "
W. A. Wilson .. .. .	2 "	1 $\frac{3}{4}$ to 2 $\frac{1}{4}$ "
S. Wilkinson .. .. .	1 $\frac{7}{8}$ "	1 $\frac{3}{4}$ to 2 "
Mrs. Anderson .. .. .	1 $\frac{7}{8}$ "	1 $\frac{3}{4}$ to 2 $\frac{1}{4}$ "
B. Chester .. .. .	2 "	1 $\frac{3}{4}$ to 2 $\frac{1}{4}$ "
Geo. Trapp .. .. .	2 "	1 $\frac{3}{4}$ to 2 $\frac{1}{4}$ "
R. T. G. Carey .. .. .	1 $\frac{3}{4}$ "	1 $\frac{3}{4}$ to 2 $\frac{1}{4}$ "
O. J. W. Whitman .. .. .	1 $\frac{7}{8}$ "	1 $\frac{3}{4}$ to 2 $\frac{1}{4}$ "
B. Caswell .. .. .	2 "	1 $\frac{3}{4}$ to 2 $\frac{1}{4}$ "
P. Oldham .. .. .	2 "	1 $\frac{3}{4}$ to 2 $\frac{1}{4}$ "
J. J. Davies .. .. .	2 "	1 $\frac{3}{4}$ to 2 $\frac{1}{4}$ "
Shaw and Stevenson .. .. .	2 "	1 $\frac{7}{8}$ to 2 $\frac{1}{4}$ "
H. B. Stevens .. .. .	2 "	1 $\frac{3}{4}$ to 2 $\frac{1}{4}$ "
Mrs. A. G. Kurth .. .. .	2 $\frac{1}{4}$ "	1 $\frac{7}{8}$ to 2 $\frac{3}{8}$ "
Progressive P. Pens .. .. .	2 $\frac{1}{8}$ "	2 to 2 $\frac{3}{8}$ "

## HEAVY BREEDS.

E. H. Larsen .. .. .	1 $\frac{7}{8}$ oz.	1 $\frac{3}{4}$ to 2 "
J. Fitzpatrick .. .. .	2 "	1 $\frac{3}{4}$ to 2 $\frac{1}{8}$ "
T. Hindley .. .. .	1 $\frac{3}{4}$ "	1 $\frac{3}{4}$ to 2 "
H. Puff .. .. .	2 "	1 $\frac{3}{4}$ to 2 $\frac{3}{8}$ "
W. J. Mee .. .. .	1 $\frac{3}{4}$ "	* "
A. Shanks .. .. .	1 $\frac{3}{4}$ "	1 to 2 "
T. W. Lutze .. .. .	1 $\frac{7}{8}$ "	1 to 2 $\frac{1}{8}$ "

\* Not sufficient eggs to secure fair average.



Competitors.		Breed.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	Total.
LIGHT BREEDS.															
*Dixie Egg Plant	..	W. Leghorns	139	154	143	143	144	142	140	132	120	116	102	98	1,573
*G. W. Hindes	..	ditto	85	141	134	136	137	137	144	138	127	118	110	119	1,526
*E. Chester	..	ditto	95	136	125	130	145	155	145	118	124	104	96	60	1,433
*T. Fanning	..	ditto	104	119	116	126	131	126	133	137	126	122	107	81	1,428
*W. Becker	..	ditto	91	116	124	116	133	131	141	132	120	109	79	94	1,386
*Mrs. L. Henderson	..	ditto	114	122	95	127	118	129	136	119	113	118	79	81	1,351
*W. Lyell	..	ditto	64	127	121	120	134	135	125	126	118	105	93	80	1,351
*Geo. Prince	..	ditto	90	140	113	118	140	136	130	122	104	96	76	82	1,347
*G. Howard	..	ditto	76	136	133	132	143	140	125	90	106	83	90	89	1,343
*C. P. Buchanan	..	ditto	86	138	124	126	136	129	131	119	116	93	85	59	1,342
G* H. Turner	..	ditto	74	118	128	123	137	141	137	126	109	91	65	65	1,314
*E. A. Smith	..	ditto	60	96	123	128	133	140	136	127	103	105	84	75	1,310
*Dr. E. C. Jennings	..	ditto	95	109	94	91	125	126	126	130	119	119	103	67	1,304
*C. Knoblauch	..	ditto	93	130	126	127	133	131	112	93	79	97	72	89	1,282
*L. G. Innes	..	ditto	95	91	105	120	135	134	129	121	104	102	85	40	1,261
*Range Poultry Farm	..	ditto	99	102	80	105	115	120	126	124	108	112	96	67	1,254
*R. Holmes	..	ditto	36	124	134	136	137	131	115	111	104	89	70	63	1,250
*Quinn's Post. P. Farm	..	ditto	62	100	94	105	134	144	135	107	108	104	80	72	1,245
*Thos. Taylor	..	ditto	70	107	96	108	115	114	112	129	126	104	82	82	1,245
*Oakland Poultry Farm	..	ditto	67	126	121	95	132	140	133	124	95	100	63	45	1,241
Mrs. L. F. Anderson	..	ditto	69	64	78	74	128	121	127	114	120	127	118	90	1,230
*O. K. Poultry Yards	..	ditto	92	124	108	103	119	118	117	113	104	84	60	54	1,196
*Mrs. A. T. Coomber	..	ditto	63	76	95	109	128	122	130	117	104	111	76	60	1,191
B. Caswell	..	ditto	101	108	105	93	122	124	122	110	114	80	47	62	1,188
Harold Fraser	..	ditto	103	116	88	88	111	95	106	128	119	74	82	69	1,179
*Mrs. R. Hunter	..	ditto	20	69	88	79	121	130	133	126	121	114	97	80	1,178
J. J. Davies	..	ditto	67	114	98	102	117	122	119	119	118	101	40	59	1,176
*J. M. Manson	..	ditto	40	83	74	113	130	129	119	121	111	132	66	56	1,174
Geo. Trapp	..	ditto	52	90	61	69	106	110	104	123	125	107	103	33	1,157
*Homulayan Poultry Farm	..	ditto	49	63	97	97	124	134	135	116	109	107	75	33	1,140
*J. Zahl	..	ditto	52	106	100	95	118	101	115	116	92	86	65	80	1,126
Mrs. A. G. Kurth	..	ditto	50	94	55	67	114	124	131	119	127	107	71	52	1,111
H. B. Stephens	..	ditto	44	65	80	75	108	118	124	113	102	110	71	49	1,059
*C. Porter	..	ditto	71	88	101	112	122	120	94	88	82	75	53	52	1,058
Progressive Poultry Pens	..	ditto	104	56	34	65	88	111	121	107	128	87	80	74	1,055

Competitors.	Breed.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	Total.
LIGHT BREEDS—continued.														
S. Wilkinson	ditto	80	62	79	96	91	101	115	102	106	72	73	76	1,053
O. W. J. Whitman	ditto	71	109	99	102	108	101	84	98	102	87	34	47	1,042
B. Chester	ditto	37	8	73	99	120	102	116	118	126	91	70	81	1,041
Shaw and Stevenson	B. Leghorns	8	92	68	91	118	108	117	119	108	88	62	61	1,040
*T. B. Hawkins	W. Leghorns	61	78	65	81	122	126	110	81	123	91	51	39	1,028
W. A. Wilson	ditto	3	48	77	71	96	112	115	104	126	89	79	90	1,010
H. F. Britten	ditto	64	75	47	78	104	107	116	112	103	84	68	51	1,009
G. Williams	ditto	82	99	95	70	80	81	96	97	112	67	59	36	994
*J. W. Newton	ditto	62	72	59	68	115	132	128	104	92	75	61	20	988
P. O. Oldham	ditto	34	49	55	66	112	118	119	113	121	93	66	34	980
R. T. G. Carey	ditto	41	96	111	104	110	90	88	70	84	83	32	47	956
A. W. Walker	ditto	13	55	53	39	114	120	123	96	117	76	72	58	936
HEAVY BREEDS.														
*Nobby Poultry Farm	B. Orpingtons	89	154	142	145	138	129	105	113	105	96	93	80	1,389
*D. Fulton	ditto	35	28	98	149	164	162	133	139	116	134	92	114	1,364
*R. Burns	ditto	10	67	127	141	146	145	120	123	112	111	101	80	1,283
*E. Morris	ditto	48	87	126	147	141	132	105	117	85	82	88	105	1,263
*Mars Poultry Farm	ditto	12	90	123	136	136	129	131	86	99	109	88	96	1,225
*A. L. Walters	ditto	92	87	63	148	157	144	131	95	99	69	84	72	1,220
*E. F. Dennis	ditto	51	101	121	133	144	133	126	79	66	118	60	86	1,218
*W. H. Reilly	C. Langshans	95	103	89	87	117	106	110	93	106	104	90	99	1,199
*W. Smith	B. Orpingtons	105	75	95	98	124	123	68	114	104	87	96	106	1,195
T. Hindley	ditto	67	132	116	106	123	121	113	93	103	67	72	59	1,172
A. Shanks	ditto	24	42	110	130	138	137	118	102	106	103	76	79	1,141
E. M. Larsen	ditto	40	82	120	123	119	120	55	117	78	76	87	41	1,058
*J. W. Macrae	ditto	..	43	72	117	132	130	116	103	109	88	55	66	1,031
T. W. Lutze	R. I. Reds	..	38	94	107	124	107	71	82	89	63	87.5	56	819
*F. A. Clausen	ditto	49	31	74	64	90	87	92	71	85	77	43	56	819
H. Puff	ditto	4	22	47	69	124	103	93	77	103	84	48	44	818
J. Fitzpatrick	ditto	51	99	81	67	98	84	68	67	51	44	49	50	809
W. J. Mee	B. Orpingtons	..	..	..	..	..	..	..	..	..	..	..	..	..
Monthly Totals...		4,000	5,979	6,297	6,804	8,023	7,947	7,563	7,126	6,932	6,228	4,897	4,447	76,243



## RESULTS OF SINGLE HEN TESTS.

Competitor.	A.	B.	C.	D.	E.	F.	Group.
	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.
LIGHT BREEDS.							
Dixie Egg Plant .. ..	235	249	303	229	257	300	1,573
G. W. Hindes .. ..	292	244	237	262	253	238	1,526
E. Chester .. ..	261	220	232	259	245	216	1,433
T. Fanning .. ..	251	221	254	193	253	256	1,428
W. Becker .. ..	233	242	214	251	208	238	1,386
Mrs. L. Henderson .. ..	234	194	232	193	272	226	1,351
W. Lyell .. ..	222	241	243	212	220	210	1,348
Geo. Prince .. ..	207	249	205	245	221	220	1,347
G. Howard .. ..	220	212	238	257	198	218	1,343
C. P. Buchanan .. ..	195	223	242	224	222	236	1,342
G. H. Turner .. ..	163	147	259	228	297	220	1,314
E. A. Smith .. ..	211	253	198	221	222	205	1,310
Dr. E. C. Jennings .. ..	180	277	234	197	226	190	1,304
C. Knoblauch .. ..	239	210	232	202	178	221	1,282
L. G. Innes .. ..	220	224	302	132	154	229	1,261
Range Poultry Farm .. ..	167	241	194	227	219	206	1,254
R. Holmes .. ..	209	235	205	209	191	201	1,250
Quinn's Post Poultry Farm .. ..	259	207	192	142	241	204	1,245
Thos. Taylor .. ..	147	238	211	203	220	226	1,245
Oakland Poultry Farm .. ..	180	215	223	215	227	181	1,241
O. K. Poultry Farm .. ..	165	236	205	191	222	177	1,196
Mrs. A. T. Coomber .. ..	187	205	207	207	162	223	1,191
Mrs. R. Hunter .. ..	178	200	149	204	229	218	1,178
J. M. Manson .. ..	246	209	238	186	142	153	1,174
Hornalayan Poultry Farm .. ..	228	184	184	146	210	188	1,140
J. Zahl .. ..	231	183	213	211	172	116	1,126
C. Porter .. ..	158	192	186	182	110	230	1,058
T. B. Hawkins .. ..	211	145	191	152	148	181	1,028
J. W. Newton .. ..	190	220	129	128	189	132	988

## HEAVY BREEDS.

Nobby Poultry Farm .. ..	281	240	224	130	260	254	1,289
D. Fulton .. ..	290	199	207	212	185	271	1,364
R. Burns .. ..	190	218	186	202	275	212	1,283
E. Morris .. ..	180	202	227	252	216	186	1,263
Mars Poultry Farm .. ..	215	223	198	205	184	200	1,225
A. E. Walters .. ..	179	222	159	231	220	209	1,220
E. F. Dennis .. ..	249	193	192	134	228	222	1,218
W. H. Reilly .. ..	197	215	219	178	170	220	1,199
W. Smith .. ..	266	198	164	193	167	207	1,195
J. W. Macrae .. ..	124	154	192	183	210	195	1,058
F. A. Claussen .. ..	151	151	164	146	148	115	875

## BALANCE-SHEET.

Receipts.				£85 0 0		
Entry Fees .. ..	Sales.	Dozen.	Average Price Per Dozen.			
			s. d.	£	s.	d.
1918, April .. ..	333 $\frac{4}{12}$	2	3	37	10	0
May .. ..	498 $\frac{3}{12}$	2	3 $\frac{1}{2}$	56	11	5
June .. ..	524 $\frac{9}{12}$	1	11 $\frac{1}{2}$	51	7	8
July .. ..	567	1	3 $\frac{1}{4}$	36	0	6
August .. ..	668 $\frac{7}{12}$	0	9 $\frac{1}{2}$	26	9	3
September .. ..	662 $\frac{3}{12}$	0	8 $\frac{1}{2}$	24	2	11
October .. ..	630 $\frac{3}{12}$	0	9 $\frac{1}{2}$	24	18	11
November .. ..	593 $\frac{1}{12}$	0	11 $\frac{1}{2}$	27	16	9
December .. ..	577 $\frac{6}{12}$	1	3 $\frac{1}{2}$	37	6	2
1919, January .. ..	519	1	4 $\frac{3}{4}$	36	4	5
February .. ..	408 $\frac{1}{12}$	2	0	40	16	2
March .. ..	370 $\frac{7}{12}$	2	2	40	2	11
				£439 7 1		
Total Receipts .. ..				£524 7 1		

BALANCE-SHEET—*continued.*

<i>Expenditure.</i>						£	s.	d.	£	s.	d.
Prize Money	..	..	..	..	..	..	..	..	50	8	0
Food—Wheat, 314 bushels	..	..	..	..	..	72	13	0			
Cracked Corn, 30 bushels	..	..	..	..	..	7	9	2			
Hulled Oats, 15 bushels	..	..	..	..	..	6	14	11			
Pollard, 390 bushels	..	..	..	..	..	32	10	0			
Bran, 195 bushels	..	..	..	..	..	15	16	10			
Dried Blood, 5½ cwt.	..	..	..	..	..	4	10	9			
Maggitt's Meal, 7 cwt.	..	..	..	..	..	2	15	3			
Green Lucerne, valued at	..	..	..	..	..	2	0	0			
Soup Meat, valued at	..	..	..	..	..	3	0	0			
									147	9	11
Balance	..	..	..	..	..				326	9	2
Total	..	..	..	..	..				£524	7	1

**DO POULTRY FARMS PAY?**

Considerable discussion has taken place with the return of the soldiers regarding possibilities of poultry farms as means of livelihood.

The experience of Mr. Giles, of the Bonaventure Poultry Farm, whose advertisement appears in the Journal, is a striking example:—

“ I started as a big strong boy, with no capital, but with a good heart, in the summer of 1888. I was sent to do up my grandmother's garden. While there, she told me if I could find the nest of one particular hen that would persist in hiding her movements in the dense scrub I could have the hen. I found her, and was overjoyed at the prospect of being the owner of a bird at last, and tucked her under my arm, and landed her safely at my home two miles away. I put the hen amongst others belonging to my mother, and as I could identify every hen's egg about the place, I was not long in spotting those laid by mine. I did not know her breed. She was pile-coloured and certainly was not pure bred, but had ten toes. For the first twelve months I sold 26s. worth of her eggs, besides letting her raise a clutch of chicks. The first year I did not have to pay anything for food, but of the amount earned I spent a guinea on Barred Plymouth Rock eggs. I put them under my treasure, and she presented me with thirteen lovely chicks, all of which I reared. When I got this clutch I commenced to buy the necessary food. Of the thirteen chicks, five were black, all pullets, and these had to be culled. Of the remaining eight I got three pullets and a cockerel to breed from. The rest I sold for the best prices I could get. For one, I raised 30s., a record which brought joy to my heart. My next move was to get work. For a start I got 15s. a week and boarded at home, for which I paid 10s., leaving me 5s. for myself. My next venture was a pen of Silver Wyandottes, purchased from a neighbour. I saw them at his house one day, and he could see how struck I was on the birds. The price was five guineas, but seeing how anxious I was to get them, the owner, who had known me all my life, said, “ If you really want them, take the birds away and pay me when you can.” I seized the offer, came home, and built a place for them, and was not long paying for the birds. From this pen I bred both the winning cockerel and poultry from the New South Wales P. P. C. and D. Society. The next year, having a lot of young stock on hand, it was rather a worry to know how to dispose of them. I found a way, however, and built up a first-class connection, and as my capital increased, so I kept on adding stock of various kinds, always the best I could possibly buy. I kept an account of every penny I received or spent. From my earnings I spent quite a lot on the best poultry books money could buy, but when all is said and done, my own powers of observation and experience which I gained from year to year, were the most valuable to me. For a long time everything had to be done on the most economical lines. The buildings were of the cheapest possible construction, mostly of material got from the bush; the house walls were made of corn bags, whitewashed inside and out, with the roof usually of bark—anything to save expense. I had no incubators, and after trying various means and methods of poultry culture



I am more than ever convinced that the best system is to follow the natural way. No matter what I do I cannot raise chickens to suit me like those I rear with hens, abedding the hen under a coop and letting the chicks run out. When the chicks are about a fortnight old I let the hen run out about 9 in the morning, and she scratches for her family. When I read now that so much capital is required in poultry farming, so much of this and that, I often laugh to myself and think how I started with one nondescript hen and no money. From this small beginning, with no help, but a very considerable amount of hindrance, I have built up the most successful business of its kind in the Commonwealth. When I say "of its kind" I mean the breeding of prize poultry, and not ordinary pure-bred utility stock. This necessitates long study—years and years of it, and there is always something to be learnt. The main thing helping to success is love of occupation. If you have no love for the work you cannot hope to make a success of it."

Mr. Giles is always keen to help others and will gladly answer reasonable inquiries, provided that an addressed and stamped envelope for reply be sent with other letter.

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### WATER AS A FACTOR IN EGG PRODUCTION.

The importance of having fresh water before poultry at all times is pointed out in the following from Director C. T. Patterson, of the Missouri Poultry Experiment Station, America:—

A number of pens which had been furnished water at all times were given water only once each day, all they could drink, then the water removed. The results were that the egg yield was reduced 50 per cent. This reduction was the same in the different varieties.

From the hen's viewpoint, water is worth as much as feed, for she can't make an egg with either one alone. Therefore, the man who furnishes high-priced feed but neglects water supply is making a great mistake, and will have to be content with a limited egg yield.

At present prices and weather conditions hens consume about six gallons of water to each 5s. worth of feed. Therefore, if the feed is worth 5s. to the hen, the water is also worth 5s.

The value of water to the hen is shown by the many uses to which it is placed.

First, to soften the food ready for digestion.

Second, in the form of blood it acts as a common carrier, and carries the nourishing part of the food from the digestive organs to the tissues where needed, and carries worn-out or exhausted tissues to the different organs to be eliminated from the body.

Third, water is important as a factor in egg production, as it enters into the composition of the egg as well as the hen's body, the egg being about 75 per cent. water.

Fourth, water is important in equalising the temperature of the hen's body, which is done in two ways. First, cold water lowers the body temperature, while warm water holds the temperature high. For this reason, we give hens cold water in summer and warm water in winter. The second method of cooling is by evaporation, which is a cooling process. The temperature of the human system is reduced by the evaporation of sweat from the surface of the body, but with the fowl evaporation takes place principally through the breathing organs, which accounts for the hen holding her mouth open and breathing rapidly on a hot day.

Observations of experiments conducted at this station lead us to believe that the first three uses of water are very much the same at all times, and that the wide range in the daily consumption of water is influenced by conditions of the weather.

The two lessons which stand out prominently as a result of experiments are:—

First, water is just as important as food.

Second, once or twice each day is not often enough to supply the water.—

"Garden and Field."

# The Orchard.

## LEMON CURING.

By W. E. BEVAN.

I read an interesting article in the "Courier" a few weeks ago in connection with the curing of lemons in Queensland, which brings to mind a very interesting and successful experiment tried by my people some twenty years ago, and which may be of use to those interested in this very profitable pursuit.

At the time I refer to, my father was interested in the culture of citrus fruits, and, being of an experimental turn of mind, he was puzzled to know how it was that, at certain periods, and during the importation of the Messina (Italian) lemons, these lemons brought from 16s. to 20s. per case, while our own lemons, which were of a good type and quality of Lisbon, only returned 2s. 6d. to 4s. 6d.

A case of Messina lemons was then purchased and thoroughly examined, and it was found that they were of an even size and colour, and had been cured, and that in this process of curing they had become very much more juicy than the fresh lemon just cut from the tree. Then, again, they were neatly wrapped and packed.

After many experiments, my father was then quite satisfied that he had hit upon the right method, and that he could produce a lemon equal to the imported article, and, to test this, a dozen cases were procured of the same size as that used by the Italian grower. The lemons were next graded and neatly wrapped in tissue paper with the trade mark of the orchard thereon, which distinctly stated that they were grown in the county of Cumberland, N.S.W., and by whom, and after being packed upon the "Diamond" principle, which was at that time introduced by Mr. Benson, the lemons were sent to test the market against the Messina lemons, and the result was that we received the same price, which proved conclusively that the right article had been produced.

Now, the mode in which our lemons were handled is this:—

Firstly, a large store was erected, about 30 ft. by 20 ft., and 10 ft. high, of split slabs; then outside and around this, about 2 ft. 6 in. away, a second store was erected. This left now a cavity of 2 ft. 6 in. all round, which was filled with earth. The ceiling was formed of heavy slabs, and a mound of earth heaped over the top for a roof. At ceiling height and at floor level, 4-inch agricultural pipes were inserted for the purpose of ventilation, and to allow the gases to escape. By watching the thermometer, which was hung in the store, we found it necessary to plug up or open the pipes occasionally, so as to maintain an equal temperature. This was affected by the amount of fruit in the store and not by outside conditions of weather.

The doors were formed after the style of a strong room; they were framed in pine and were 6 in. thick, having the space between the internal and external lining well packed with sand. These doors, having bevelled edges, shut against felt and were held firmly shut by a lever lock.

For the purpose of illustrating more fully my explanation, I have shown a sketch of the store.

This store, which we termed the "cool store" (and I shall refer to it in future as such), was found to maintain an even temperature of from 60 to 65 degrees throughout the winter and summer; and when not containing fruit was perfectly dark inside.

The next process was as follows:—The lemons were clipped in a green state and laid in large flat wooden trays, which had previously been filled with ti-tree bark, which had been put through a chaffcutter with a long cut. After the ti-tree was dry it was then teased out and looked like soft dry shavings.

The object of the ti-tree shaving was, being of an absorbent nature, it absorbed the moisture from any lemon that might rot, and thus prevented this rot from extending to its neighbour.

I might mention here that the lemons were put into these trays in the orchard and immediately after being clipped. They were then carted down and the trays then packed one on top of the other in the "cool store." The doors were then shut, and the lemons left to cure in an even temperature and in the dark.

Occasionally, the trays were overhauled, and any rotting lemons were taken out, the percentage being very small, and this was due, I fancy, chiefly to want of care.

The result of curing in this store seemed to show that the lemon became more juicy; the skin became thin and tough without crinkling, and a nice light straw colour was obtained.

By this process lemons were kept from four to six months, and on one occasion they were held for eight months as an experiment.

This enabled us to put a first-class article on the market when lemons were scarce, and we were amply repaid for the trouble and outlay.

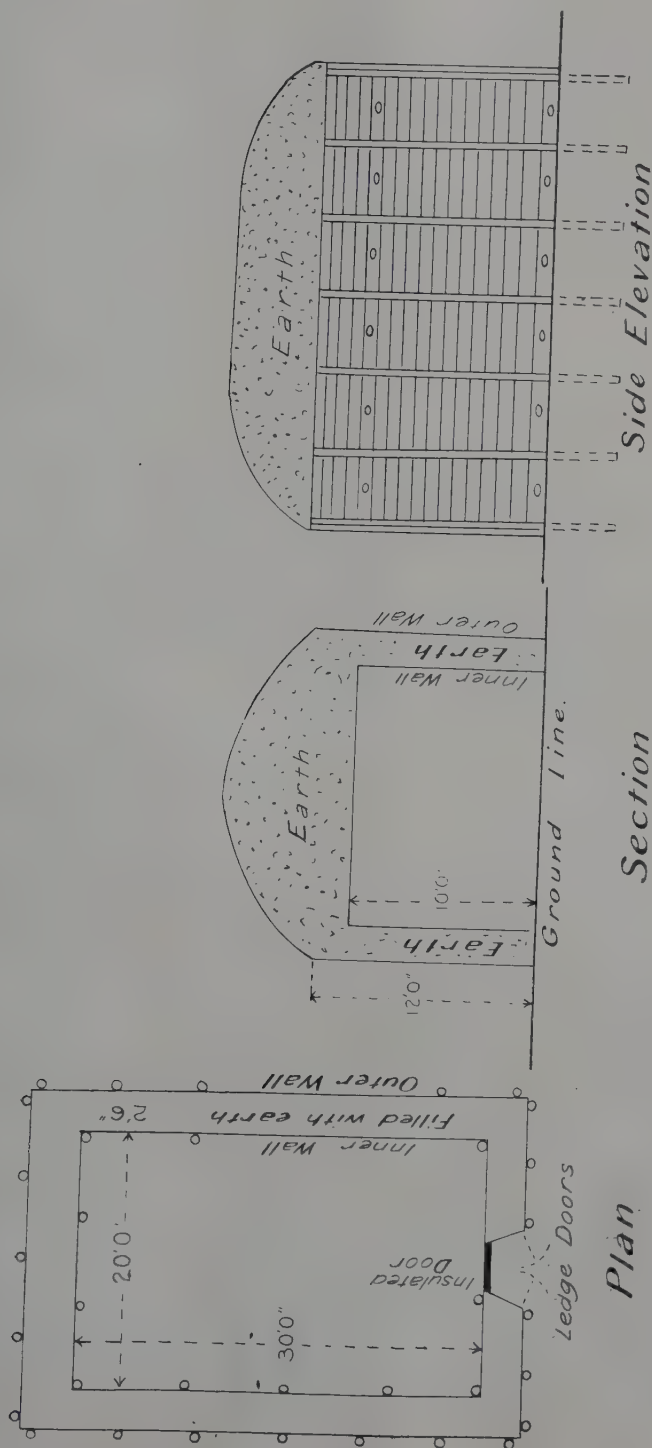


PLATE 17.



## Viticulture.

### NOTES ON THE GRAPES UNDER TEST AT THE EXPERIMENTAL VINEYARD, AT COOMINYA, UP TO THE PRESENT (APRIL-MAY, 1919).

By C. ROSS, F.R.H.S., I.F.C., Department of Agriculture and Stock.

#### Table and Wine Grapes.

It is not intended to give a minute detailed report here, but the following notes may be read with interest:—The vineyard was planted with cuttings during September, 1916. Although the season was late and some of the cuttings dry, they made a fairly good strike, but made only moderate growth during the summer. Before planting, the cuttings were submitted to a potassium-sulphide bath as a protection against "black spot," and regularly dusted with dry sulphur throughout the growing period. In the spring of 1917, after pruning, each vine was swabbed twice with sulphuric acid solution ( $\frac{3}{4}$  pint to 1 gallon of water), and as iron sulphate was not added, it caused some of the canes to crack. Dusting and spraying with Bordeaux mixture and dry sulphur was not so successful owing to wet weather, and "black spot" was very prevalent in consequence. It was interesting to note that some varieties have always been free from any infestation, whilst others were affected, to a varied extent, some very slightly and some very badly. The same precautions were adopted in the following spring (1918) except that the formula used for swabbing was changed to 1 lb. sulphuric acid with  $3\frac{1}{2}$  lb. of iron sulphate added to 1 gallon of water, with the result that no cracking or splitting of canes occurred. As this season has been dry all through, every cepage in the vineyard is absolutely free from "spot" or other pest.

The behaviour of the following varieties has been carefully noted; those marked with an asterisk have done the best so far, are true to name, and can be safely recommended. Many of those not marked, some of which were planted more recently, may be recommended and distributed after one or two years' further test, viz.:—

#### EARLY BLACK TABLES.

\**Black Frontignac*.—Free growth, rather slender canes, good crop; small to medium sized berries, closely set on cylindrical shaped bunches; colour, brownish red; exquisite flavour; makes a delicious sweet wine.

\**Royal Ascot*.—Very strong growth, heavy crop; large berries, close set on shouldered good sized bunch; plumlike flavour when quite ripe.

\**Snow's Muscat*.—Good growth, fair crop, medium berries, loosely set bunch, high muscat flavour.



PLATE 18.—GROS COLMAN (GROWN ON TRELLIS).

*Portuguese*.—Good growth, fair crop; a small blue-black grape; its chief merit is its extra earliness; it ripens the first of all the blacks.

\**Black Hamburg*.—Strong growth, good crop; the good qualities of this grape are well known.

\**Madresfield Court*.—(Early to mid-season); strong growth, good crop; large oval berries on large tapering bunch; delicate muscat flavour.



PLATE 19.—MADRESFIELD COURT.

### Mid-Season Varieties.

\**Trentham Black*.—Strong growth, good crop, fine berry and bunch, richly flavoured.

\**Lady Downe's*.—Strong growth, fair crop, good sized berries, well shouldered bunches not tightly set, faint muscat flavour.

\**Cinsaut*.—Strong growth, a fine crop, fair sized berry and bunch. This was the most beautiful looking grape in the vineyard. The flavour is pleasant, sweet, and juicy.

\**Wantage*.—Strong growth, heavy crop; medium red berries, fairly loose and well set on large bunches.

\**Aramon*.—Strong growth, good crop; useful dessert, and also produces large quantities of wine.

### Mid-Season to Late.

\**Worthy Hall*.—Very strong growth; handsome large berries, borne on large heavily shouldered bunches. Some seasons bears a second crop on laterals, which will hang well into May if protected from sudden changes of weather.



\**Black Prince*.—Strong growth, fair crop, well-known table variety.



PLATE 20.—BLACK PRINCE.

\**Black Alicante*.—Extra strong growth, heavy crop, fine berries on handsome bunches. Will hang a long time if protected from weather.

#### Late.

\**Red Prince*.—Extra strong growth; fair crop; deep red berry, loosely set on large bunches. A fine table grape.

\**Red Malaga*.—Strong growth, moderate crop, large berry, long tapering loose set bunch.

\**Gros Colman*.—Vigorous growth, good crop, very large berries borne on good sized divided bunches.

\**Henab Turki*.—Strong growth; heavy crop; large oval red berries, loosely set on long, large tapering bunches. Suffered from sunscald.

#### Extra Late.

\**Grand Turk*.—Extra strong growth, fair crop, large berries and bunches.

\**Black Malaga*.—Extra strong growth; fair crop; fine berries on large, long loosely set bunches. A long keeper.

#### EARLY WHITE TABLE GRAPES.

\**Raisin des Dames*.—Strong growth, fair crop, large oval berries, handsome bunches. Excellent in every way.

\**Golden Chasselas*.—Slender but free growth, good crop, medium sized berries and bunches. An excellent first early, pleasant flavoured grape.

\**Royal Muscadine*.—Slender but free growth, abundant crop. Another excellent first-early variety.

\**Ciotat*.—The old parsley leaved grape. Slender, but free growth, enormous crop, small berries and bunches of rather poor quality. Worth growing only as a curiosity.

\**Sweetwater*.—Strong growth, good crop. Well-known variety.

\**Chaouch*.—Vigorous, upright growth; heavy crop; large berries, closely set; above average sized bunches. Will not stand wet.

\**Ferdinand de Lesseps*.—Vigorous growth, good crop, medium berries and bunches. One of the very best flavoured.

\**Muscat Ottonel*.—Slender but free growth; fair crop; round, medium berries, borne on pretty cylindrical bunches. First early Muscat.

### Mid-Season.

\**Pedro Ximines*.—Extra strong growth, good crop, medium berry, fine bunch. A favourite in all grape-growing countries. Also used for making sherry wines.

\**Bermestia*.—Strong growth, fair crop, fine berry and bunch. A magnificent variety of deep amber colour.

\**White Portugal*.—Very strong growth. A moderate crop of very beautiful bunches.

\**Trebbiano*.—Extra strong growth. A moderate crop of exceedingly large bunches.

### Late Varieties.

\**Belas Blanco*.—Extra strong growth, fair crop, large berries loosely set on big bunches.

\**Gordo Blanco*.—Strong growth, good crop. A well-known leading Muscat.

\**Dorradillo*.—Strong growth; moderate crop; good berry and bunch, rather close set. Useful late market sort; carries well.

\**Crystal*.—Extra strong growth, only moderate crop (requires more age), large berries on beautiful medium sized bunches.

\**Servante*.—Extra strong growth, good crop, beautiful semi-transparent berries, average sized bunches.

### STRICTLY WINE VARIETIES.

The following have made strong growth and are all heavy croppers: Tokay (white), Verdellho (white), Quick's Seedling (black), Pride of Australia (black), Oeillade (black), Grenache (black), Carignan

(black), Merlot (black), Terret Noir (black), Carbenet Sauvignon (black), White Sauvignon (white), Alicante Bouschet (black), Cornelian (white), Shiraz (black).

### Currants of Commerce.

Zante and Corinth.



PLATE 21.—GROS COLMAN (GROWN AS BUSH VINE).

### CUTTINGS AVAILABLE.

Small parcels of cuttings of any of the enumerated varieties, containing not more than twenty cuttings, will be despatched to any address, freight paid, at 2s. 6d. each parcel.

Applications to be made to the Under Secretary for Agriculture and Stock not later than the middle of June, with amount of cost enclosed.

The following varieties have not been sufficiently tested to confidently recommend at present. After further observations have been noted, such of those that are good doers, and can safely be recommended, will be sent out. Some have already been discarded as failures, viz.:—

*Mannum*.—A South Australian white wine variety; it has made good growth and promises well.

*Temperano*.—Very poor growth so far.

*Sultana*.—Grand strong growth, but not yet fruiting.

*Santa Paula*.—A pinkish variety of the Cornielion type: made fair growth, but not fruited yet.

*Riesling*.—Poor growth; worthless here. Discarded.

*Palomino*.—Poor growth.

*Champion Muscat*.—Indifferent growth on its own roots, but grafted to a hybrid stock it has made vigorous growth, and fruited well.

*Muscat of Alexandria*.—Grown well, but not fruited.

*Waltham Cross*.—In wet seasons this is very subject to "black spot." This season it has made moderate growth, perfectly clean and healthy, and bore a few elegant bunches.



*Ladies' Finger* (Cornichon Blanc).—Good growth, not fruited yet.

*Early Green*.—Small, white wine; weak growth, apparently of no value here.

*Daria*.—Poor to fair growth; suggest grafting to resistant stocks.

*Centennial*.—This is the largest sized white grape known, but it has been quite a failure here. A cool climate, with fairly rich, sandy, well-drained loam is what it requires, but it is never a heavy bearer. It does well at Wallangarra.

*Buckland's Sweetwater*.—Fairly good growth, fine large berries, but badly scorched with the sun.

*Albillo*.—A sherry grape; poor growth, not cropping.

*Concord* (American type).—Strong growth, good crop. Sometimes called Improved Isabella.

*Dr. Haag* (American type).—Good growth, not bearing.

*Allen's Hybrid* (American type).—Strong growth, large black berries, medium bunch.

*Goethe* (American type).—Strong growth, good crop.

*Miss Basters*.—Good growth, fair sized berry and bunch.

*Wood's Red Muscat*.—Poor growth, no fruit.

*Chasselas Negropont*.—Moderate slender growth, good sized early pink variety.

*Mrs. Pince*.—Moderate growth, not cropping.

*Mataro*.—Very poor growth.

*Malbec*.—Very poor growth.

*Red Hanneport*.—More recently planted. For further record.

*Black Mammoth*.—Failure.

*Roussalet*.—Identical with Raisin des Dames.

*Admirale de Courtillicr*.—Failure.

*Dattier*.—Failure.

*Teneron*.—Failure.

*Malvoise de Nitzes*.—Strong growth; a late white of questionable value.

*Carbenet*.—Failure.

*Grand Noir*.—Poor growth.

*Tinta Amarella*.—Questionable nomenclature.

*Folle Blanche*.—Moderate growth; a leading brandy-making grape.

*Pinneau Noir*.—Poor growth, but cropped well.

*Black Sultana*.—Questionable nomenclature.

*Duke of Buccleuch*.—More recently planted. Further record.

*Admiral Sturdee*.—Identical with Henab Turki.

*Prince Rupert*.—Identical with White Portugal.

*Flame Tokay*.—Recently planted.

*Ohanez*.—Recently planted.



PLATE 22.—PICKING GROS COLMAN GRAPES (GROWN ON TRELLIS).

### PHYLLOXERA RESISTANT VINES FOR RECONSTITUTING VINEYARDS.

The list herewith attached contains the strongest growers and hardiest varieties of Franco-American Hybrids, and are best suited for the purpose they are intended for. They are not grown for fruit production, but used as stocks upon which to work other sorts; being highly resistant to the attack of the vine louse (*Phylloxera vastatrix*) and also themselves being immune to "black spot," have a tendency to transmit that quality to the scions grafted thereto.

Some are most suitable for wet land and others for dry, viz.:—

Aramon x Rupestris, Ganzin No. 1.

Riparia x Rupestris, 3306.

Rupestris du Lot.

Mourvedre x Rupestris, 1202.

Chasselas Berlandieri, 41 B.

Riparia—Cordifolia x Rupestris 1068.

Riparia Glorie de Montpellier.

Riparia x Rupestris, 101 $\frac{1}{4}$ .

Carbenet x Rupestris, 33.

Auxerois x Rupestris.

Several thousands of cuttings will be available for distribution this season at 5s. per 100, 3s. for 50, and 2s. for small parcels, inclusive of packing and freight.

Applications should be made before the middle of June to the Under Secretary, Department of Agriculture and Stock, together with the amount of cost.

# Tropical Industries.

## THE CULTIVATION OF SUGAR-CANE IN QUEENSLAND.

By HARRY T. EASTERBY, General Superintendent, Bureau of Sugar Experiment Stations.

### PART II.—SCRUB PLANTING.

In selecting scrub lands it is sometimes possible to market any valuable timber that may be upon it, such as silky oak, bean, maple, cedar, &c., and this should always be done if possible. Tracks should be first cut through the scrubs in order that the land may be thoroughly inspected and valuable timber located. The site of the farmer's dwelling should be placed on the most desirable spot. After brushing the scrub, as it is termed, viz., cutting down all light stuff, undergrowth, and vines, as previously mentioned, the most marketable timber is felled. A good time for burning should be chosen, as the cost of this operation varies considerably. In a dry time the expense is much less when a good burn is secured. Gathering the timber to be burnt in heaps should be most carefully done, so that the subsequent burning, if any, may be of the lightest character. There should be little left but the standing stumps after a good burn. Scrub near a badly grub-infested area should be avoided.

In holing for cane plants it is usual to have the rows made about 5 ft. apart. The distance between the holes varies from 9 in. up to 2 or 3 ft. The number of holes per acre, however, is usually from 2,500 to 3,000. Mattocks are generally used for cane holing, though in some instances, bars, picks, and shovels have been preferred, but the mattock is considered the best tool for all-round purposes. Holes can be made 14 in. long by 9 in. wide, and 9 in. deep. They should always be long enough to take a cane plant with three eyes. Only the very best cane should be used for plants, and the greatest care and supervision should be exercised in this respect. Good varieties only should be planted, and this matter will be dealt with in a subsequent part of this series.

When the cane is up it should be kept clean by means of hoes, at the same time giving the stools as much "cultivation" as possible, *i.e.*, stirring the soil well around the young plants. Roads should also be made for the purpose of getting the cane off at the time of harvest.

Plenty of cultivation by hoeing should be given young cane in scrub soils apart from the desire to keep down weeds, as it materially assists the growth of the crop. Virgin scrub land should not require manures at first, but sometimes a little lime can be used around the cane plants to correct acidity and make a richer juice in the cane. This is often valuable in scrub lands for canegrowing, where the magnesia ratio is too high.



When the harvesting season arrives, portable line is usually supplied by the Mill to the farmer, and trucks sufficient for the daily quota of cane he is to send in, are provided. The line is connected with the permanent 2 ft. gauge, and is laid in the field to suit the cutting.

Cutting is almost entirely done on the contract system under an award of the Industrial Arbitration Court of Queensland. At the present time the sugar districts are divided into three, viz., No. 1 Northern, No. 2 Central, and No. 3 Southern. The rates vary as under:—

							No. 1.	No. 2.	No. 3.
							s. d.	s. d.	s. d.
Crops	15 tons to the acre and over	..	..	..	..	..	6 9	6 6	6 3
..	14 to 15 tons to the acre	..	..	..	..	..	7 0	6 9	6 6
..	13 to 14	..	..	..	..	..	7 3	7 0	6 9
..	12 to 13	..	..	..	..	..	7 9	7 6	7 3

and so on *pro rata*.

Burnt or stripped cane (*i.e.*, cane from which the leaves have been removed) is cut at 1s. per ton less than above rates. Cane loaded into drays or wagons, once only, 6d. per ton less than above rates.

Cane on unploughed, stony, or loggy ground 6d. per ton over the drays or wagons, once only, 6d. per ton less than above rates.

A form of agreement for cutting is provided in the award of the Arbitration Court, and can generally be bought at printers' and stationers' shops in cane-growing districts.

The wages to be paid to sugar-field workers as distinct from cane-cutters on contract are:—

					No. 1 District, per Hour.	No. 2 District, per Hour.	No. 3 District, per Hour.
					s. d.	s. d.	s. d.
(a)	Field Workers over 18 years of age	..	..	..	1 7	1 6	1 5
(b)	Youths from 14 to 16 years of age	..	..	..	0 9	0 8½	0 8½
(c)	Youths from 16 to 18 years of age	..	..	..	1 0	0 11	0 10
(d)	Cane-cutters (day labour),	..	..	..	2 1	2 0	1 11½

The hours worked are not to exceed forty-eight in any one week, but these may be worked between 6.30 a.m. and 6.30 p.m. Accommodation for men must be supplied free, and food also, if required, the farmer being allowed to charge £1 per week in the No. 1 district, 19s. in the No. 2 district, and 18s. in the No. 3 district. Certain holidays are also allowed, in all twelve. Work done on any of these has to be paid for either at double rates or time and a-half. Overtime on week days is reckoned at time and a-half, and on Sundays at double rates. Every canegrower should secure a printed copy of the award.

When the cane is cut it is loaded upon trucks or wagons, and hauled to the mill. It is almost entirely universal in North Queensland to load into trucks upon the portable line. These are drawn out in pairs, or more, to the permanent line to form a "rake," and are then picked up

by the mill locomotive and hauled to the mill for weighing and crushing. The cane in the trucks should be tightly bound by means of chains, and a ratchet wheel placed upon the trucks for that purpose, so as to prevent any cane slipping off in transit, which would be the cane-grower's loss.

After cutting, the trash is burnt, and the area cleaned up. A fresh crop of cane springs from the old " stools," which is known as " first ratoons." The same care is given these, which ultimately develop into a crop which is cut in the same manner as the plant crop. A series of ratoons is usually grown up to five crops on new scrub land, and each burning of the trash helps to destroy the stumps, the extent depending on the class of timber.

When it is decided to put the land under the plough, the old remaining stumps, of which there are generally a good number, are either grubbed out, burnt out, or blown out with explosives.

In taking up land for canegrowing purposes it must not be forgotten that the State Agricultural Bank is prepared to assist canegrowers on very liberal terms, and advances are also made by the sugar-mills.

It will be seen that many implements are not required in cultivating cane on scrub lands while the area is under stumps. Horses, however, are needed for drawing the trucks to the permanent line. A house for the farmer and his family, and if the farm is a large one, barracks for cane-cutters, will have to be provided. At the present time any estimate of the cost of these would be too high, for, due to the war and the lack of shipping, galvanised iron is most expensive, while timber has also risen greatly in price. It is anticipated, however, that these costs will gradually decrease as we get back to normal conditions.

Varieties of cane and their suitability to different districts will be dealt with later. Meantime, it may be said that the cane known as New Guinea 15, or Badila, has been found most suitable to the Northern scrubs.

It is not wise to leave good land too long under stumps, as the ground worked by hoeing naturally soon gets hard, and an area should be prepared for cultivation purposes as soon as practicable. Although fine crops of heavy cane are usually won from virgin scrubs, the yields begin to decrease in tonnage as time goes on, while on good land, under the plough, properly cultivated and treated, the same yields can be secured year after year, provided the seasons are favourable.

Rainfall is, of course, a factor that requires consideration, and a table showing the average rainfalls in different districts will later on be furnished. It is sufficient to say now that the sugar districts north from Townsville are fortunate in the amount of moisture they receive, and a real drought is practically unknown in the Northern coastal cane districts.

Nearness to a tramway or railway connecting with the sugar-mill to which it is proposed to send the cane, should also be studied in selecting cane lands.

The photograph shown below will give a good idea of scrub land when cleared and partly covered with cane.



PLATE 23.—PART OF A FINE FLAT ON MESSRS. GLEN AND MACNESS' FARM "KALKADOON," SOUTH LIVERPOOL CREEK, SOUTH JOHNSTONE MILL AREA.



In the foreground will be seen a number of logs that yet require burning, while the timber at the back shows the dense scrub that has to be laid low before operations can be commenced. This particular piece of scrub land is a fine flat on Messrs. Glen and Mackness's farm, South Liverpool Creek, in the South Johnstone mill area, and we are indebted to the "Australian Sugar Journal" for the photo. Crops of cane are seen on the right with stumps here and there.

Cane should always be planted in scrub land, as far as possible, in straight lines, as this is a great help in subsequent cultivation and often enables the land to be brought more quickly under the plough.

*(To be continued.)*

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## THE CENTRAL SUGAR DISTRICTS.

The General Superintendent of the Bureau of Sugar Experiment Stations has received the following report from the Field Assistant, Mr. J. C. Murray:—

"Throughout the month, the canegrowing areas of Gooburrum, Millbank, Waterview, Bucca, Bingera, the intermediate areas between the latter place and Gin Gin, Wallaville, Currajong, Fairyhills, and Gin Gin have been visited.

### "GOOBURRUM.

"At the time of visiting this place, conditions were very dry. The cane was parched and lifeless-looking, and in numbers of cases the young cane had died. Misses after planting were frequent, owing to the plant having lain long in the ground without sufficient moisture to force growth. There was very little standover cane in evidence. Wells, water-courses, and dams had dried up. The farmers did not anticipate a cutting, even if rain did come. Owing to the hardness of the soil, deep cultivation was very difficult. Therefore the chances of conserving sub-surface moisture were not as great as if more intensive cultivation were possible. Seepage is considerable in this area, owing to the nature of the lower soil strata. The farmers are not troubled with noxious weeds to any great extent. Small patches of *paspalum*, nut, and red Natal grass are evident, though not in sufficient quantities to cause much anxiety. The well water here appears to contain magnesium and sodium chlorides. It is improbable that it would be suitable for irrigation. D1135 is the principal cane growing. There is a small quantity of Black Innes, Mahona, and Clarke's Seedling. Most of the growers, however, are still pinning their faith to the former variety.

"Since these observations were made, good rains have fallen at Gooburrum, and at a casual glance from a distance, cane seems to have a new lease of life, changing from the yellowish white to a deep healthy green.

### "WATERVIEW.

"This area was visited before the rain. The loose sandy nature of the soil and subsoil is not conducive to the conservation of moisture, and the cane here suffered severely. The hardihood of the D1135, however, saved many farmers from having to plough out, and now that the rain has come, although it is improbable there will be a cutting during 1919, the losses should not be so severe as anticipated before the change of the weather. Greater planting of green crops is necessary here, as well as liming. Most of this land has been under cane for many years without a spell, and tests show a considerable acid reaction. It is noticeable that all farmers who had been going in for green manuring and deep cultivation weathered the drought much better than those who did not. No mechanical traction for agricultural purposes was noticeable at Waterview, most of the growers using horses and the usual types of disc ploughs, cultivators, &c. Very few had been going in for liming—a matter that requires attention by the farmers if they wish to improve their present output. Insect pests have not given the farmers much trouble. The farms are fairly free from weeds and present a clean well-kept appearance, although more intensive cultivation is advisable, especially now the rain has put in an appearance. Intensive cultivation will give gratifying results to the farmer, if diligently carried on. There are no immediate local sources of lime about these areas. Most of the growers have got to go far afield if they wish to obtain a supply of burnt lime.

"Most of the labour is done by co-operation.

## "BUCCA.

"Bucca was visited before the rain and presented the usual parched appearance. The principal varieties growing are 1900 Seedling, D1135, and Mahona. In the opinion of some of the farmers, the 1900 Seedling is a cane that will do well here. Mahona is a cane that has been growing for some time past, but the growers are doing away with it to a large extent. Bucca is at present unfortunately situated. Sugar-growing is at a standstill pending satisfactory arrangements for milling accommodation.

## "MILLBANK.

"Owing to the dry weather, this area, which usually grows fairly heavy crops, is very backward. As heavy a cut as 100 tons to the acre of D1135 has been harvested here.

"The soil is fairly rich in humus and has a slightly alkaline reaction for the most part. At the time of visiting, the farmers were pessimistic as to the proceedings for this year, even if rain fell. Rain has fallen since, however, although owing to the backward condition of the crop, it is unlikely there will be any fit to cut.

"Water is found at about 40 ft. on some of the holdings, although it is doubtful whether it would be suitable for irrigation.

"This is an area which requires intensive cultivation, the continual stirring of the soil particles keeping them from binding, there being a tendency to do this, owing to the nature of the ground. There is an increasing demand amongst the growers for more varieties. It is the consensus of opinion that the available canes are being worked out, or rather, unsuitable in these latitudes.

## "BINGERA.

"This area was visited just prior to the rainfall. The plantation management was busy irrigating a plot of standover cane.

"In comparing these areas, with regard to suitability for irrigation, with places like Ayr, it is noticeable that seepage here is greater than at the northern town, thus involving more work in the matter of irrigation. The pump being used at Bingera is probably the largest in Queensland. Through the courtesy of the management, I was shown over the plant and given an insight into their methods of irrigating. Bingera, this year, is going in for both extensive and intensive cultivation. Mechanical traction is aiding the work and agricultural operations are proceeding rapidly.

"The principal varieties growing are D1135, Badila, and Mahona. The first-named cane is still retained as a standard variety, although in a lot of cases it is degenerating very much. Mahona is considered unsatisfactory on the red soils, and it is unlikely any more of this variety will be planted. The soil is principally red volcanic, with clayey subsoils, interspersed with igneous formations. New varieties are urgently needed if the industry is not to suffer in this area.

## "SOUTH KOLAN.

"This district was visited during the drought, and had a very thirsty appearance. The growers here, however, study their work keenly, and in many cases, by dint of hard labour and intensive cultivation, have done a lot to ward off the effects of the drought. One farmer at South Kolan, Mr. T. Bates, as an experiment, planted 4 acres of D1135; eight rows of the plants he soaked before placing in the ground; these came up several days before the unsoaked and had a much more flourishing appearance. It is likely, though, that if rain did not come soon after the soaked plants came up, they would deteriorate quicker than the unsoaked ones.

"The varieties growing at South Kolan are D1135, H.Q.114, 1900 Seedling, N.G. 16, M. 54, and Badila. Of these, the 1900 Seedling and the D1135 appear to be doing best, although N.G. 16 has a decidedly healthy appearance, and seemed to stand the drought well. The soil here, in places, is a sandy loam with a clayey subsoil; in other places it is a red loam with patches of sterile soil and a clayey subsoil interspersed with silica and alluvial deposits. There are no immediate local sources of lime.

## "GIN GIN.

"The soil is a red loam on the ridges, alluvial in the hollows. The principal canes growing are D1135, 1900 Seedling, Mahona, and Malagache. Some small areas of Malagache, planted the second week in October, look strong and healthy and withstood the drought without getting the extremely wilted appearance of some of the other varieties. 1900 Seedling planted in September, also held its own. The ridges on the Gin Gin farm areas require more vegetable matter than they at present contain. Mauritius bean and cowpea could be planted with profitable results, thus assisting to retard the escape of subsurface moisture.

" The effect of the rain on cane here has been most marked, the plants almost immediately responding, changing colour from their unhealthy whitish yellow to a rich green.

" Most of the farms here are well drained, although it is necessary on the farms which lie in the lower levels to do a fair amount of artificial work in this respect.

" Most of the growers in this area have had very satisfactory strikes, this being due to careful selection of plants. There are considerable local sources of lime in the environs of the Gin Gin cane-producing areas, which would be a boon to the farmers if opened up.

#### " CURRAJONG.

" This area was visited just about the time the first rain fell. The young cane has made a splendid response, particularly the 1900 Seedling. This variety does very well at Currajong. The soil is a sandy loam, interspersed with patches of red loam, appearing to be suitable for the Mauritius Seedling.

" It is unlikely that there will be any cane cut here this season, although some of the farmers have a few tons of first ratoon standover.

" The farmers here understand the value of intensive cultivation, most of the holdings being well kept and free from weeds. The soil is very loose and friable, thus making a fine surface condition possible. Soil tests taken show varying reactions as regards alkalinity and acidity. Liming, however, would be beneficial to most of the farmers about Currajong; also planting of Mauritius bean or cowpea as a green manure.

" One or two growers are giving their cane land a spell and planting maize, sweet potatoes, &c. The rotation of crops such as these is advisable and will be beneficial. In most cases it is legumes or leguminous crops that are substituted.

#### " FAIRYHILLS.

" The rain had just started at the time of visiting Fairyhills.

" The principal canes growing are D1135, Mahona, Rappoe, 1900 Seedling, B156. Many of the farmers are displacing D1135 with Mahona. Others are getting excellent results from Rappoe.

" On some of the holdings the rain that had just commenced was showing itself to good effect on the first ratoon standover; also on the December planting. Owing to the hard time, however, that the March plant cane has had, it will take some time before an appreciable difference is made in the appearance of this. The soil here is principally a red loam, interspersed with silica, and, in some places, quantities of limestone. It has a gravelly loam subsoil and drains well. There is a considerable amount of lime about Fairyhills, which would be of the greatest advantage to the growers, if worked.

" So far, the highest tonnage per acre that has been taken off Fairyhills has been about 50 tons to the acre of Rappoe. Green manuring is very necessary in these areas.

#### " MAROONDAN.

" The farmers in the Maroondan area were not so fortunate as regards rain, at the time of visiting, as in the other Gin Gin localities, not sufficient having fallen to make the heavy black soil sticky. The loam is heavy and dark, with a heavy clayey subsoil containing marine, alluvial, limestone, granite, diorite, and igneous formations.

" Last season it was gratifying to note that the farmers have almost achieved a record in the way of getting high tests for their cane. The following are a few of the results:—

Clark's Seedling test	..	..	..	..	17.12 density
1900 ..	..	..	..	..	17.13
Mahona ..	..	..	..	..	16.74
D1135 ..	..	..	..	..	15

" It will be seen by these results, that whatever the tonnage may be, the sugar content is high. Extensive green crops, to insure the supply of natural green manures, are necessary about Maroondan. Also, on some of the farms, burnt lime to the extent of about 25 cwt. to the acre would be beneficial, as the soil, in some cases, has an acid reaction, and is very tenacious when cultivating. Some plants of 1900 Seedling have been attacked by fungus, but nothing serious has resulted, the stools attacked having been destroyed. Water is to be found at a depth of about 30 ft.



“ With regard to the varieties growing, speaking from observations made, it would appear that 1900 and Clarke's Seedling were the two canes that could be most profitably grown. Mahona, as a plant crop, is good, but it is very shy in ratooning. Noxious weeds are in evidence to a certain extent, although they are not causing much trouble. Principal among them are *paspalum*, nut grass, couch, *convolvulus*, *sida retusa*

#### “ WALLAVILLE.

“ The days allotted for visiting Wallaville were interrupted by a considerable amount of rain. Consequently, I was unable to carry out the work intended on this area. From what observations that could be made, however, the cane appeared to be suffering very much from the drought, having a lifeless and yellow appearance. The soil is a red loam on the ridges and principally alluvial in the hollows. From what could be observed, the D1135 and 1900 Seedling seemed to have held out best against the dry spells, which, at Wallaville, appear to have been exceptional previous to the 13th February. A little irrigation is in progress on lucerne at Wallaville, but none of the cane was being watered.

#### “ AVONDALE.

“ At the time of visiting Avondale good rains had fallen, and the effect on the cane was very marked, especially about Tegege. The soil in this area is probably a sandy loam, with a sandy subsoil. It cultivates and drains well. Some of the farmers have small areas of second ratoon standover, but there will be nothing fit to cut this season.

“ Avondale Plantation has, however, about 70 acres of D1135, which seems to have displayed considerable hardihood in withstanding the drought. The farmers here have been getting an average density of about 14. As regards noxious weeds, nut grass is very bad. The farmers have simply given up trying to combat it, and let it grow. They find that when it attains a height of about one foot it dies down. If this is the case, providing the cane is sufficiently vigorous to combat it during the early periods of growth, it should not be so harmful as is generally supposed. There is a great growth in other grasses and legumes. In much of the plant cane there is a very high percentage of misses, owing to the dry conditions. Some of the farmers are doing a considerable amount of cowpea sowing as a green manure. Most of the growers understand the importance of drainage and have good systems.

#### “ WATERLOO.

“ Cane-growing has been abandoned altogether at Waterloo, owing to the closure of the mill. The land that has hitherto been growing cane here is found to be very suitable for pineapples and bananas, and many of the settlers are planting these products.

“ The greatest courtesy was extended to me by the mill authorities and the growers at the different centres visited.”

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### THE MACKAY SUGAR DISTRICTS.

The General Superintendent of the Bureau of Sugar Experiment Stations has received the following report from the Field Assistant, Mr. J. C. Murray, upon the Mackay sugar districts:—

“ Throughout the month the Mackay sub-areas of Pleystowe, Racecourse, Farleigh, Sarina, Hatton, Pinnacle, Gargett, Marian, and Mirani have been visited.

#### “ PLEYSTOWE.

“ Conditions are fairly encouraging from a farmers' point of view. The weather has been favourable for growing, and much of the cane is very forward. More rain is needed, though, between now and the crushing if expectations as regards tonnages are to be fulfilled. Coots are the worst pest, and are a very considerable menace to the young cane. Other birds, like crows, ibis, &c., are very useful in canefields. Nut grass presents more trouble than any other noxious weed, whether indigenous or introduced. Generally speaking, the growers here understand the necessity for intensive cultivation. As in most sugar areas, those farmers who cultivate, drain, and green manure thoroughly get far the best results. Lime is required in the Pleystowe areas, as on an average the tests taken of the soil show an acid reaction. Labour is carried on by individual effort in the off-season. Not a great deal of trouble has been experienced during the cutting in the past.

## " RACECOURSE.

"This area looks well. The principal varieties growing are Clark's Seedling, D1135, Badila, and Cheribon. Clark's Seedling, however, seems to be the most satisfactory from a farmer's point of view, growing with a good density, stooling and ratooning well. On some of the plots, where the river has overflowed and left heavy deposits of silt, the Badila has made extraordinary progress. Considerable trouble is caused by the nut grass. Of the pests the farmers have to contend with, the coots are the worst. These birds play havoc with the young cane, speedily destroying considerable areas. The land here has a fair system of surface drainage. Lime is very necessary on some of the farms. This, however, is very hard to obtain in suitable quantities for agriculture, the cost also making it prohibitive. If the farmers on these areas could obtain quantities of burnt lime at a moderate price, their outlay should be justified owing to the necessity of neutralising the acid in the soil. The soil around Racecourse seems to contain fair quantities of humus, the farmers in the past having kept in mind the value of green manuring. Cowpea is a favourite green crop with them, but at present it is difficult to get the seed. Other growers plough in green maize, some let the maize ripen and plough in the lot. This planting of green manures and rotation of crops is not only an excellent thing from an agricultural point of view, but it also largely contributes towards keeping down the grubs, borers, and fungoid diseases, by temporarily destroying their homes. Except in cutting season, most of the growers do their own work. The farms are fairly clean and free from weeds. Very little labour trouble has been experienced lately. The weather during the last month has been excellent for growing, the cane having progressed more than it usually does at this period of the year, owing to more moderate rains than generally prevail between New Year and the Equinox.

## " FARLEIGH.

"This area shows fair promise this year. The varieties principally growing are Clark's Seedling, Goru, D1135, M.S. 1900, and Malagache. Other varieties that are being tried include Badila Seedling, Q1121, Q813, Q970, and Hybrid No. 1. All these canes look well and healthy, having a flourishing appearance. Some of the Clark's Seedling, where the land is more fertile than the average, is falling down, having made too vigorous a growth. Badila on the same soil is standing and growing well. As on other Mackay areas, the majority of the Farleigh farms require lime. Green manuring has been gone in for to a certain extent, cowpea being the favourite crop. As regards planting, most of the growers use the top plants and change as often as possible. Most of the labour in the off season is done by the farmer himself. Growers here mostly cut up and plough in old stools. Trash is burnt. Ratoons are seldom volunteered. Farmers here are not troubled much with pests, excepting the coots.

## " HATTON, PINNACLE, GARGETT.

"These areas look fairly prosperous, there being indications of a cutting well up to the average. The soil—a light sandy loam with a clayey subsoil interspersed with alluvial deposits—cultivates and drains fairly well. The principal varieties growing—D1135, Goru, Clark's Seedling, and Malagache—are doing well. In the case of the latter it grows luxuriantly, with plenty of cane and a fair density of about 13 per cent. It has very little top, though, so consequently if a farmer grows much of it he gets very little chopchop. Not much trouble is experienced with cane pests, bush rats in the uplands and coots on the river flats being the worst the growers have to deal with. The farms here are fairly rich in humus, but want more intensively cultivating and liming, especially the latter. The growers, however, realise this, but adverse circumstances over which they have no control militate against them at every turn. Water is to be found by sinking at about 30 feet.

## " MARIAN, MIRANI.

"These areas are well up to the average as regards cane growth and general prospects. The principal varieties growing are Malagache, Badila, D1135, M.S. 1900, and Oranite. The first three varieties appear to be favoured by the farmers, testing

on the average:—Badila, 15.05; D1135, 13; Malagache, 14. There are, however, some very fine plots of 1900 Seedling. This cane could be grown, when the land is not badly frosted, more extensively than it is. It grows with good density, is easy to cut, not extra heavy in trash, and has a good top for chop-chop. The soil in these areas is a light loam with a clayey subsoil. It cultivates and drains well, seepage being considerable on the river flats. Tests taken of the soil show a slight acid reaction. The use of lime could be recommended here. A fair amount of green manuring has been gone in for, also a rotation of leguminous crops on some farms. Mr. Paul, a Marian farmer, achieved a marked success with molasses as a fertiliser. He allowed the molasses to run broadcast over his land, using a tank on a dray for the purpose, to the extent of about 1,200 gallons per acre, and ploughed in. About 4 acres was treated in this manner, and about 8 acres of Clark's Seedling planted, four on and four alongside the piece treated. The result was that the fertilised cane easily beat the other in every particular. Glancing along the headlands the eye is immediately arrested at the termination of the treated ground by the marked difference in the tops of the Seedling. One droops while the other holds itself up in a most marked manner, causing a startling contrast. The general appearance of the cane on the fertilised portion is much superior to the other. A marine deposit containing lime is being worked near Marian, but opinions vary amongst the farmers as to its value as a fertiliser. With regard to pests at these places, coots are the worst. The farmers change plants amongst themselves as often as possible. Very little volunteer ratooning is done, most of the growers burning trash and cutting up and ploughing in old stools.

#### “SARINA.

“The following are the most satisfactory canes growing:—Q.903, c.e.s. 15; Badila, c.e.s. 15.05; H.Q. 114, c.e.s. 14.89; Q 116, c.e.s. 14; D1135, c.e.s. 13. It will be seen by these tests that the above canes are fairly satisfactory. Of the first named variety there are only a few stools at present, but the growers hope to obtain more for planting next year. M.S.1900 is, however, a good cane on some of the holdings. The soil about Sarina is a heavy dark loam interspersed with alluvial deposits, containing alluvial and igneous rock. The land drains well, both as regards surface and subsurface moisture. Lime is needed in these areas, also more intensive cultivation and green manuring. Weeds grow very fast here, and consequently, as many of the growers have only themselves and perhaps one helper to depend on, the chipping rather gets out of hand. Noxious weeds and grasses include *Paspalum*, *Rhodes*, *Kangaroo*, *Red Natal* grasses, while “Stinking Roger,” *Star Burr*, *Convolvulus*, also flourish. Bush rodents and coots are the principal pests. A couple of tractors are in use in the district, but the farmers do not seem to be enthusiastic about them. I am indebted to the various mills visited for much courtesy shown me, also the farmers for their assistance and courtesy.”

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### A POSSIBLE FACTOR IN COCONUT BEETLE CONTROL.

“Tropical Agriculture,” Ceylon, reprints the following note from the “Review of Applied Entomology,” vol. vi., pt. 5, on the above subject, which will doubtless prove of interest to our Northern and Papuan readers:—

“A natural enemy of the coconut beetle (*Oryctes*) in the Philippines has been found by Mr. F. Warner in the island of Bohol. This is a flying lemur *Galeopterus* *sp.*, which has been domesticated by the Filipinos, and bred, partly for the value of its skin, which is used for the making of hats, and partly for catching coconut beetles. This small animal is insectivorous and harmless, the only vegetation eaten by it being the leaves of the jak, *Artocarpus integrifolia*. Nothing is known of its breeding habits. Its flesh is said to be poisonous, which renders it unlikely to have many natural enemies, so that if it can be multiplied rapidly and if, as reported, it is of a non-roving disposition, it should prove of value in the control of the beetle.



# Entomology.

## GRUB INVESTIGATION.

The General Superintendent of the Bureau of Sugar Experiment Stations has received the following report upon Cane Grub Investigation from the Entomologist, Dr. J. F. Illingworth:—

“ The heavy rains starting on the 25th of February have saved the day in many of our canefields. Conditions were prime for the grubs, and they were getting in their work to an alarming extent. As usual, Greenhills was the first to show the characteristic yellowing in the affected portions. Some of the ratoon fields lying near the woods have already succumbed in spit of the rains.

### “ FEEDING TREES.

“ Continuing a study of the relation of feeding trees to infestation, I have made further interesting observations; and I can now say with some confidence that the beetles travel approximately half a mile when going with the wind, but scarcely any against it. These conclusions are based upon numerous observations in a number of localities, and in no case have I found evidence to refute the theory.

“ As pointed out last month, the infested areas at Greenhills lie principally within the half-mile limit, and the worst infestation is in the higher parts of the fields lying near the feeding trees.

“ I have recently instituted careful surveys in the infested areas, by counting the number of grubs per stool of cane. As a typical example of this method I may cite a field of first ratoons, at Greenhills, where, by working at a gradually increasing distance back from the forest, we got the following grubs:—14, 13, 15, 8, 3, 1, the last stool being just about on the half-mile from feeding-trees to windward. Another excellent example, which works out in perfect accord with this theory, is an infested farm near Gordonvale. Feeding trees border it to windward, south and east, and the principal infested areas are on the side toward this timber. The worst infested fields are now out of cultivation, having failed completely last season. However, I was able to get the following remarkable figures, by taking the average of a series of stools:—

Chains from the Forest.	Grubs per Stool.	Class of Cane.
12 .. ..	45 .. ..	Badila, 1st ratoon.
16 .. ..	17 .. ..	Badila ” ”
19 .. ..	13 .. ..	Badila ” ”
22 .. ..	12 .. ..	Badila ” ”
28 .. ..	7 .. ..	Goru ” ”
35 .. ..	5 .. ..	Goru ” ”
40 .. ..	0 .. ..	Goru ” ”

“ The same decrease in the number of grubs per stool is shown in every part of the farm as one recedes from the feeding trees.

### “ CULTIVATION EXPERIMENTS.

“ As stated in last report, I was unable to get these experiments started in time to get the maximum benefits from them. Nevertheless, they show us that there is no material difference between working the soil once a week and once a fortnight; also, that the plough has considerable advantage for disturbing the grubs.

#### Every week—

Plough, average number of grubs per stool	..	..	5
Cultivator	”	”	8½
Harrow	”	”	9½

#### Every fortnight—

Plough	”	”	6
Cultivator	”	”	8
Harrow	”	”	7½

Check.	”	”	13½
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"The check in this case does not show its true value, for it was cultivated twice after the experiment began, in spite of my instructions to the contrary. Still, the better cultivation in the other plots is very noticeable from the figures.

"There is very decided evidence that cultivation as a means of control must begin during the two weeks after the beetles emerge, before they start laying. Apparently, once the eggs are deposited, it is a difficult matter to destroy all of them by horse work, for they are probably placed near or under the stool. The fields that got this cultivation are in excellent condition at present (14th March), and have a fine dark colour. The field J1 is a good example, since it has suffered from the grubs in former years. It is worth noting that it was planted very late last October, for J4, which was planted in August, is suffering severely from grubs and is located just across the tram line, and more distant from the feeding trees.

"Right in line with this argument, I might mention the two ratoon fields, L7 and the lower half of L6, which were cut in November and ratooned while the beetles were on the wing. They are both in prime condition, with no apparent signs of grubs, while several of the fields nearby are already going yellow. It will be recalled that these fields were planted in October, 1917, and gave successful cuts last season.

#### "ON THE VALUE OF GREEN CROPS.

"The finest cane on the Greenhills estate is in the part of F3 which was planted to Mauritius beans. The lower part of this block was not treated, and it is an easy matter to see where the beans left off, for the cane is shorter, and is badly yellowing from the attack of grubs. All of this block was a failure last time it was planted.

#### "MERINGA EXPERIMENTAL PLOT.

"The cane in these plots is in excellent condition, especially the areas which were under beans. All of the fifteen plots, which include the checks, have had frequent cultivation during the whole flight of the beetles, and this probably has considerably reduced the number of grubs.

"While it is rather early to draw conclusions, I would say, from tests that we have made of individual stools in the various plots, that white arsenic gives considerable promise when used in the drill at the time of planting, especially when mixed with meatworks manure, which the grubs appear to favour as food.

#### "CARBON BISULPHIDE EXPERIMENTS.

"The following observations were made on a badly-infested field (B1, of Gordonvale farm) of first ratoons. By digging test stools early in February, while the cane was still of good colour, I found that the number of grubs ran from 8 to 49. The owner decided to apply carbon bisulphide, and this was started on the 18th February. The application was made with the ordinary Dank's pump, set so that the discharge was about 3 in. beneath the surface. The maximum charge was given (slot No. 9 = 1 drachm and 55 minims) on one side of the stool, to start with, but the middle of the field was treated on both sides of the stool, using the same charge. Finally, the last part of the field was not treated, for heavy rains (about 10 in.) started on the 25th of February.

"On 8th March I examined this field for grubs, and found excellent results. Along the south side of the field, where we had previously found an average of 45 grubs per stool, I could only get an average of 5. No dead ones were visible in the soil, for they had probably rotted and been carried away by ants. This was the part treated on one side only.

"In the middle of the field, where the stools received treatment on both sides, I was unable to find a single grub, and there was a vigorous growth of new roots starting. The tops, too, looked beautifully green with no sign of injury from the treatment. I had previously found an average of 13 grubs per stool in this location. Evidently the rains which followed, a day or so after the application, saved the cane from any ill effects of the chemical.

"I also found that the grubs were still numerous in the untreated portion, and the cane was showing a very noticeable withering, in marked contrast to the treated plants.

#### "EXPERIMENTS WITH NITROGEN FERTILISERS.

"Our field experiments with these chemicals are not completed, but there are some observations which should be noted. Experienced growers know that the best results come from the application of these fertilisers after the rains begin. They then give the cane the maximum boost. In our experiments with both nitrate of soda

and sulphate of ammonia to determine their value in making the cane resistant to grubs, I find that where these chemicals were applied during the dry weather in August their effect upon the growth of the cane has not been noticeable, and in the treated field at Greenhills the grubs are showing considerably. On the other hand, where ammonia was applied during January, the cane shows a remarkable development and improved colour; and though I found grubs under some of the stools the numerous new roots are keeping up the vigour of the plant. In another month the contest will be decided, for this is the worst season in the activity of the grubs.

"In order to determine the direct effect of these two chemicals upon the grubs, I placed them in soils with varying amounts of the fertilisers, giving them no roots to feed upon. The experiment was carried along for ten days with no noticeable effect. Several of the grubs became injured and died, but those that remained were perfectly normal at the finish. Hence, I would conclude that the control exerted by these chemicals lies principally in the increased vigour that they give to the plant.

#### " EXPERIMENTS WITH MOLASSES AS A BAIT.

"One might naturally conclude that molasses would be attractive to grubs if placed in the soil. It was recently suggested that this would act as a valuable bait if mixed with poisons. Experiments, however, have demonstrated that the grubs will not eat it—at least, not enough to be of value. Where the same amounts of arsenic were used alone in the soil, results were very rapid—the grubs dying in one to four days. Even the dry white arsenic gave splendid results. Since this chemical has a great affinity for humus, and remains in the surface soil for years, it may prove best to apply it in the drill at the time of planting, or possibly dust it around the young plants, so that the grubs will come in contact with it when they begin their depredations.

#### " INTRODUCTION OF PARASITES.

"That we may leave no stone unturned, I have continued investigations of the available parasites of white grubs in other sugar-growing countries. There are a number available, though it is problematical whether they would prove of value against our native insects. Anyway, it is worth trying, for if we can get them to attack any of our numerous Scarabeids (root-feeding grubs) the expense of introducing them will be well repaid. These valuable friends are doing excellent service in countries like Hawaii, Porto Rico, Mauritius, &c.

"It will be interesting to quote from a letter just received from D. D'emmeretz de Charmoy, entomologist, of the latter country. He says:

"There are several parasites of white grubs here. Apart from *Diclis rufa*, an indigenous species parasitic upon two of our melonothid grubs, *Rhizotrogus granivorus* and *Rhizotrogus pallens*, the others have been introduced.

"I am sending you a copy of a bulletin on the introduction of *Typhla parallela*, in which you will find a detailed account of the introduction of this parasite, as well as a general description of the spread of its host, *Phytalus smithi*.

"The other principal pest of sugar-cane is *Oryctes tarandus*, which has lately been the cause of considerable damage to canes in certain parts of the island; so much so that I went to Madagascar in 1917 for the purpose of bringing over certain Scoliids, which I thought might prove parasitic upon *Oryctes tarandus*. The details of this introduction are set out in the report I am sending you.

"Since the publication of this report, *Scolia oryctophaga* has been found in places where the insects had originally been liberated, so that I think the parasite to be definitely established. Its effects in checking the spread of *Oryctes tarandus* is now only a question of time.

"I am extremely interested in the work undertaken in Queensland, for the purpose of controlling cane grubs, and feel certain that your efforts will result in complete success.

"It would be a real pleasure for me to help you in any way, should you require my services."

### TO DESTROY RATS.

When a house is infested with rats which refuse to be caught by cheese and other baits, a few drops of the highly scented oil of rhodium poured on the bottom of the cage will be an attraction which they cannot refuse.



## General Notes.

### IMPURE STOCK FEEDS.

#### ADVICE TO FARMERS.

The Department of Agriculture and Stock has lately received information of the landing, ex s.s. "Camira," of a consignment of what is termed "Mill Offal," and is probably intended to be sold in some form or other as feed for young stock. The advice received from the port of shipment is that it is a mixture of ground weevils, mice excreta, mill sweepings, &c., and until lately was unsaleable in South Australia.

It is for dealing with such matters as this that the Stock Foods Bill which was presented to Parliament last session is intended to cover, and farmers should be careful when purchasing composite foods for their young stock.

### HOW TO LAY OFF AN ACRE OR LESS.

"The Farm," Adelaide, gives the following useful rules for calculating small areas of land:—

#### I.—TO GET ONE ACRE MEASURE.

Rod Measures: 10 x 16; 8 x 20; 5 x 32; 4 x 40.

Yard Measures: 5 x 968; 10 x 484; 20 x 242; 40 x 121.

Feet Measures: 208.7 x 208.7; 220 x 198; 110 x 396; 60 x 726; 120 x 363; 300 x 145; 400 x 108.9.

#### II.—TO GET LESS THAN AN ACRE.

To measure off—

$\frac{1}{2}$ -acre it will take 147 $\frac{1}{2}$  feet each way.

$\frac{3}{4}$ -acre it will take 120 $\frac{1}{2}$  feet each way.

$\frac{1}{4}$ -acre it will take 104 $\frac{3}{4}$  feet each way.

$\frac{1}{8}$ -acre it will take 73 $\frac{1}{2}$  feet each way.

### DRYING APPLES FOR HOUSEHOLD USES.

Discussing the drying of fruit at recent meetings of one or two branches of the Agricultural Bureau, the Assistant Fruit Expert remarked that apples had the recommendation that almost any mid-season or late variety would produce a satisfactory dried product—says the writer of the "Weekly Notes," issued by the New South Wales Department of Agriculture). In the cases of the stone fruits, only certain varieties were really suitable, while for dried apples the choice could be wider, although varieties like Granny Smith, Stone Pippin, London Pippin, and Dunn's Favourite, produced a dried article of better quality. Moreover, while with stone fruit only good specimens would give a satisfactory result, in the case of apples, any sound reflects could be used, so that the process was one way of using a by-product that would otherwise be wasted.

The apples should be peeled and cored, then sliced, and dropped into a weak brine—about as salty as soup. They must not be left longer in this than 20 minutes, or they become too salty, but must be transferred to the sulphuring chamber before being evaporated. Where the quantity that is being handled is small—such as for a household's own use, or little more, the sulphuring can be carried out by using a large packing case, wide enough to cover the trays, and high enough to allow several trays to be stacked one above another, so that they can all be treated at one time. A level piece of ground should be chosen, and a small hole dug, in which to place the vessel containing the sulphur. The stacked trays should be placed over the hole, the sulphur put in the hole, and lit, and the whole covered with the packing case, which should have been well lined with paper, to prevent the fumes from escaping too rapidly. To fumigate a chamber of 200 cubic feet (say, 5 ft. by 5 ft. by 8 ft.), 1 lb. of sulphur may be considered sufficient, and from that may be calculated the small quantity required for such a small cubic space as that of an ordinary packing case. The sulphuring should generally take about twenty minutes, but if the peeled apples are not put into brine a little longer—say thirty minutes—will be required.

From the sulphur chamber, the trays should be removed to the drying green or the evaporator, from which the fruit should be transferred to sweat boxes or sacks, in which the whole sample can even up—a very necessary part of the process with apples—"Town and Country."

# Answers to Correspondents.

## CHILLI WINE.

MRS. BAXTER—

Take 2 quarts of water, 10 small bruised chillies,  $\frac{1}{2}$  ounce of citric acid, 2 tablespoonful of white sugar (burnt black), 1 teaspoonful essence of lemon, and 3 lb. of sugar. Pour boiling water on the ingredients; colour with the burnt sugar; then, when cool, bottle and cork well.

Another method is to take 1 lb. of brown sugar, 2 quarts of water, 8 small chillies,  $\frac{1}{2}$  ounce of citric acid, a teaspoonful of sugar (burnt black), and a teaspoonful of essence of lemon. Pour boiling water on the chillies, acid, and sugar. When cold, mix the burnt sugar to colour the mixture; add the essence; strain when cold and bottle.

## TO BANISH FLIES.

C. BUTLER, Bentley Park Farm, Edmonton, Cairns—

It has always been a troublesome question what to do with flies in the summer. Here is the best method of destroying them that we know of:—

Take half a teaspoonful of black pepper in powder form, one teaspoonful of brown sugar, and one teaspoonful of cream. Mix them well together, and place in the room on a plate when the flies are troublesome, and they will soon disappear. Cold green tea made very strong and sweetened with sugar will also, when set in a room in saucers, attract flies and destroy them. For flies in the stable or dairy, French entomologists have found that flies have a great objection to the colour "blue," and if tenements infested with flies are washed with a blue, instead of a white wash, flies will desert the place. By using the following formula a farmer who had 170 cows in different sheds, where they were pestered with flies, observed that in one shed, the walls of which were blue, the cows were not worried. He therefore added a blue colour to the lime with which he washed the walls of his buildings, and from that time the flies deserted them. The formula he used for the wash was: To 20 gallons of water add 10 lb. of slaked lime,  $\frac{3}{4}$  lb. of ultramarine blue. The washing was done twice during the summer. Any remedy, especially such a simple one, is well worth trying in districts where the flies in summer in Queensland are such a serious pest.

Some flies lay eggs; others, such as blow flies, reproduce live maggots. House flies lay eggs in house rubbish, rags, &c.; also in manure heaps.

## INVASION OF INSECTS ATTRACTED BY LIGHT.

Mr. Hy. Tryon, Government Entomologist, to whom your specimens of insects were submitted, has reported or them as follows:—

"The insects submitted are examples of a small and common fly belonging to the genus *Psychoda*, one of the so-called "Owl Midges." They breed in organic matter and not infrequently occur in enormous numbers, and, as they are attracted to light, are not uncommonly seen—small as they are. Again, individuals will display their very active movements in window-panes at times. Under ordinary circumstances, their wings are characteristically clothed with hairs, but the specimens submitted had almost entirely lost this endowment, evidently having been subject to abrasion. This, and the light attractiveness alluded to, as well as the circumstances under which they were met with, inclines me to conclude that were it not for your lamp their presence would not have claimed your attention. Having one by one come under its influence and battered their wings against the lamp-globe, they fell on to the table until they were sufficiently numerous to claim attention, their presence on daylight supervening being especially evident.

"Entomologists have reared *Psychodids* from eggs laid on dead insects. In this may be found the explanation of their having jumped on to the bodies of mosquitoes, occurring on the tablecloth where they happened to be, and present there also, under circumstances identical with those that brought them thither.

"A closely related *Psychodid* may be found settled on the backs of badly groomed horses here, and was formerly pointed out to me, in error, as the cause of the mange that affected them.

"The family includes, however, some narrower-winged kinds than are the true *Psychodas*. These, unlike the latter, are undoubtedly blood suckers, and named *Phlebotamus* accordingly. Of these, more than one has been inculpated as the intermediary pest of Maltese fever."

HENRY TRYON.

# The Markets.

## PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR APRIL, 1919.

Article.		APRIL.
		Prices.
Bacon	lb.	11½d.
Barley	bush.	...
Bran	ton	£7 5s.
Broom Millet	"	£50 to £80
Broom Millet (Sydney price)	"	£50 to £75
Butter (First Grade)	cwt.	177s. 4d.
Chaff, Mixed	ton	£9 to £11
Chaff, Oaten	"	£9 to £9 15s.
Chaff, Lucerne	"	£11 6s. to £11 12s.
Chaff, Wheaten	"	£7 5s. to £8 15s.
Cheese	lb.	11d. to 1s. 4½d.
Flour	ton	£12
Hams	lb.	1s. 3d. to 1s. 4d.
Hay, Lucerne	ton	£8
Hay, Oaten	"	...
Hay, Wheaten	"	...
Honey	lb.	4d. to 5d.
Maize	bush.	8s. 6d. to 8s. 8d.
Oats (Seed)	"	5s. 6d.
Onions	ton	£16 to £18
Peanuts	lb.	5d. to 7d.
Pollard	ton	£8 5s.
Potatoes	"	£18 10s. to £21 10s.
Potatoes (Sweet)	cwt.	12s. 4d. to 12s. 6d.
Pumpkins (Cattle)	ton	£11 10s. to £13 10s.
Eggs	doz.	1s. 9d. to 2s. 9d.
Fowls	per pair	4s. to 8s. 6d.
Ducks, English	"	3s. to 3s. 10d.
Ducks, Muscovy	"	4s. to 7s. 6d.
Geese	"	5s. 5d. to 8s.
Turkeys (Hens)	"	8s. 6d. to 14s.
Turkeys (Gobblers)	"	25s. to 30s.
Wheat (Milling)	bush.	...

## VEGETABLES—TURBOT STREET MARKETS.

Beans, per sugar-bag	...	3s. to 6s.
Beetroot, per dozen bundles	...	1s. 6d. to 2s.
Cabbages, per dozen	...	2s. 9d. to 10s. 9d.
Carrots, per dozen bunches	...	1s. 6d. to 2s.
Cucumbers, per dozen	...	2s. to 3s. 6d.
Lettuce, per dozen	...	1s. to 6s.
Marrows, per dozen	...	2s. 6d. to 6s.
Parsnips, per dozen bunches	...	...
Peas, per sugar-bag	...	10s. to 14s.
Potatoes (Sweet), per sugar-bag	...	5s. 6d. to 7s.
Pumpkins (table), per cwt.	...	6s. to 12s.
Tomatoes, per quarter-case	...	3s. to 4s. 6d.



**SOUTHERN FRUIT MARKETS.**

Article.	APRIL.	
	Prices.	
Bananas (Queensland), per case ... ..	18s. to 22s.	
Bananas (Tweed River), per case ... ..	19s. to 23s.	
Bananas (Fiji), per bunch ... ..	...	
Bananas (G.M.), per bunch ... ..	...	
Bananas (G.M.), per case ... ..	...	
Lemons, per bushel-case ... ..	18s. to 24s.	
Passion Fruit (Queensland), per case ... ..	...	
Pears, per bushel-case ... ..	3s. to 4s.	
Pineapples (Queens), per double case ... ..	...	
Pineapples (Ripleys), per case ... ..	12s. to 15s.	
Pineapples (Common), per case ... ..	5s. to 6s.	
Tomatoes, per half-case ... ..	5s. to 9s.	

**PRICES OF FRUIT—TURBOT STREET MARKETS.**

Apples, Eating, per bushel-case ... ..	5s. to 6s. 6d.
Apples, Eating (Imported), per bushel-case ... ..	7s. to 11s.
Apples, Cooking, per bushel-case ... ..	9s. to 12s.
Bananas (Cavendish), per dozen ... ..	2½d. to 6½d.
Bananas (Sugar), per dozen ... ..	2d. to 6d.
Citrons, per hundredweight ... ..	7s. to 8s.
Cocoanuts, per sack ... ..	15s. to 25s.
Lemons (Lisbon), per quarter-case ... ..	3s. to 4s. 6d.
Mandarins, per case ... ..	9s. to 10s.
Oranges, per case ... ..	7s. to 9s.
Passion Fruit, per quarter-case ... ..	7s. to 10s.
Peaches, per half bushel-case ... ..	5s. to 8s.
Peanuts, per lb. ... ..	5d. to 7d.
Pears, per quarter-case ... ..	10s. to 18s.
Persimmons, per quarter-case ... ..	5s. to 6s. 6d.
Pielmelons, per dozen ... ..	1s. to 3s.
Pineapples (Ripley), per dozen ... ..	3s. 6d. to 4s.
Pineapples (Rough), per dozen ... ..	3s. 6d.
Pineapples (Smooth), per dozen ... ..	2s. 6d.
Plums, per case ... ..	9s. to 14s.
Rockmelons, per dozen ... ..	...
Sugar-melons, per dozen ... ..	...
Tomatoes, per quarter-case (ripe) ... ..	...
Tomatoes, per quarter-case (green) ... ..	...

**TOP PRICES, ENOGGERA YARDS, MARCH, 1919.**

Animal.	MARCH.	
	Prices.	
Bullocks ... ..	£20 10s. to £25 2s. 6d.	
Bullocks (Single) ... ..	...	
Cows ... ..	£15 to £17 5s.	
Merino Wethers ... ..	46s.	
Crossbred Wethers ... ..	46s.	
Merino Ewes ... ..	30s.	
Crossbred Ewes ... ..	36s. 3d.	
Lambs ... ..	37s. 6d.	
Pigs (Porkers) ... ..	47s.	

# RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF MARCH, 1919, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING MARCH, 1919 AND 1918, FOR COMPARISON.

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	Mar.	No. of Years' Records.	Mar., 1919.	Mar., 1918.		Mar.	No. of Years' Records.	Mar., 1919.	Mar., 1918.
<i>North Coast.</i>					<i>South Coast—continued:</i>				
Atherton ...	In. 8.78	18	In. 5.99	In. 9.88	Nambour ...	In. 9.89	23	In. 8.87	In. 10.13
Cairns ...	18.47	37	6.23	11.18	Nanango ...	3.38	37	4.93	2.24
Cardwell ...	16.86	47	3.82	26.71	Rockhampton ...	5.28	32	3.13	1.80
Cooktown ...	15.15	43	8.63	9.60	Woodford ...	8.47	32	5.92	6.15
Herberton ...	8.39	32	2.71	7.39					
Ingham ...	16.98	27	5.62	28.95					
Innisfail ...	25.95	38	13.99	24.04					
Mossman ...	20.63	11	5.11	10.49					
Townsville ...	8.24	48	1.95	2.54					
<i>Central Coast.</i>					<i>Darling Downs.</i>				
Ayr ...	7.72	32	3.03	0.48	Dalby ...	2.87	49	1.80	0.69
Bowen ...	6.04	48	3.06	0.77	Emu Vale ...	2.68	23	5.62	0.42
Charters Towers ...	3.72	37	1.80	2.28	Jimbour ...	2.71	31	3.34	0.23
Mackay ...	12.67	48	4.45	7.26	Miles ...	2.90	34	1.61	0.45
Proserpine ...	12.66	16	6.61	5.38	Stanthorpe ...	2.75	46	6.55	0.35
St. Lawrence ...	6.29	48	2.41	1.40	Toowoomba ...	3.96	47	5.25	1.12
					Warwick ...	2.89	32	5.31	0.26
<i>South Coast.</i>					<i>Maranoa.</i>				
Biggenden ...	4.55	20	2.71	2.80	Roma ...	2.95	45	1.20	0.24
Bundaberg ...	5.73	36	5.37	3.08					
Brisbane ...	5.92	68	6.02	3.05					
Childers ...	5.38	24	4.46	2.43					
Crohamhurst ...	12.30	25	11.25	10.79					
Esk ...	4.96	32	6.29	1.82					
Gayndah ...	3.27	48	4.94	1.65					
Gympie ...	6.43	49	5.60	3.22					
Glasshouse M'tains	9.16	11	9.29	8.59					
Kilkivan ...	4.15	40	4.25	1.35					
Maryborough ...	6.55	48	4.97	4.04					
					<i>State Farms, &amp;c.</i>				
					Bungeworgorai ...	2.01	5	1.02	0.52
					Gatton College ...	3.54	20	5.35	0.54
					Gindie ...	3.17	20	0.15	0.65
					Hermitage ...	2.66	13	5.65	0.57
					Kairi ...	5.57	5	3.36	...
					Sugar Experiment Station, Mackay	12.18	22	1.92	7.14
					Warren ...	2.95	5	0.87	2.12

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for March this year, and for the same period of 1918, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND, State Meteorologist.

## Farm and Garden Notes for June.

FIELD.—Winter begins on the 24th of this month, and frosts will already have been experienced in some of the more exposed districts of the Southern coast and on the Darling Downs. Hence insect pests will, to a great extent, cease from troubling, and weeds will also be no serious drawback to cultivation. The month of June is considered by the most successful lucerne-growers to be the best time to lay down this crop, as any weeds which may spring up in the event of a dropping season will be so slow-growing that the young lucerne plants will not be checked by them.

The land should now be got ready for millets, sorghums, panicum, &c. Oats, barley, vetches, clover, tobacco, buckwheat, field carrots, and Swedes may now be sown. Some advocate the sowing of early maize and potatoes during this month, but obviously this can only apply to the more tropical parts of Queensland. The land may be got ready, but in the Southern districts and on the tableland neither maize nor potatoes should be planted before August or, at the earliest, in warm early districts, at the end of July. There is always almost a certainty of frosts, more or less severe, during these months. Arrowroot will be nearly ready for digging, but we would not advise taking up the bulbs until the frosts of July have occurred. Take up sweet potatoes, yams, and ginger. Should there be a heavy crop, and consequently a glut in the market, sweet potatoes may be kept by storing them in a cool place in dry sand, taking care that they are thoroughly ripe before digging. The ripeness may be known by the milky juice of a broken tuber remaining white when dry. Should the juice turn dark, the potato is unripe, and will rot or dry up and shrivel in the sand pit. Before pitting, spread the tubers out in a dry barn or in the open, if the weather be fine. In pitting them or storing them in hills, lay them on a thick layer of sand; then pour dry sand over them till all the crevices are filled and a layer of sand is formed above them; then put down another layer of tubers, and repeat the process until the hill is of the requisite size. The sand excludes the air, and the potatoes will keep right through the winter. Late wheat may still be sown, but it is too late for a field crop of onions. In tropical Queensland the bulk of the coffee crop should be off by the end of July. Yams may be unearthed. Cuttings of cinnamon and kola-nut tree may be made, the cuttings being planted under bell glasses. Collect divi-divi pods and tobacco leaves. English potatoes may be planted. The opium poppy will now be blooming and forming capsules. Gather tilseed (sesame), and plant out young tobacco plants if the weather be suitable. Sugar-cane cutting may be commenced. Keep the cultivator moving amongst the pineapples. Gather all ripe bananas. Fibre may be produced from the old stems.

KITCHEN GARDEN.—Cabbage, cauliflower, and lettuce may be planted out as they become large enough. Plant asparagus and rhubarb in well-prepared beds in rows. In planting rhubarb it will probably be found more profitable to buy the crowns than to grow them from seed, and the same remark applies to asparagus.

Sow cabbage, red cabbage, peas, lettuce, broad beans, carrots, radish, turnip, beet, leeks, and herbs of various kinds, such as sage, thyme, mint, &c. Eschalots, if ready, may be transplanted; also, horse-radish can be set out now.

The earlier sowings of all root crops should now be ready to thin out if this has not been already attended to.

Keep down the weeds among the growing crops by a free use of the hoe and cultivator.

The weather is generally dry at this time of the year, so the more thorough the cultivation the better for the crops.



Land for early potatoes should now be got ready by well digging or ploughing.

Tomatoes intended to be planted out when the weather gets warmer may be sown towards the end of the month in a frame where the young plants will be protected from frost.

FLOWER GARDEN.—No time is now to be lost, for many kinds of plants need to be planted out early to have the opportunity of rooting and gathering strength in the cool moist spring time to prepare them for the trial of heat they must endure later on. Do not put your labour on poor soil. Raise only the best varieties of plants in the garden; it costs no more to raise good varieties than poor ones. Prune closely all the hybrid perpetual roses; and tie up, without pruning, to trellis or stakes the climbing and tea-scented varieties, if not already done. These and other shrubs may still be planted. See where a new tree or shrub can be planted; get these in position; then they will give you abundance of spring bloom. Renovate and make lawns, and plant all kinds of edging. Finish all pruning. Divide the roots of chrysanthemums, perennial phlox, and all other hardy clumps; and cuttings of all the summer bedding plants may be propagated.

Sow first lot, in small quantities, of hardy and half-hardy annuals, biennials, and perennials, some of which are better raised in boxes and transplanted into the open ground, but many of this class can, however, be successfully raised in the open if the weather is favourable. Antirrhinum, carnation, picotees, dianthus, hollyhock, larkspur, pansy, petunia, *Phlox Drummondii*, stocks, wallflower, and zinnias, &c., may be sown either in boxes or open beds; mignonette is best sown where it is intended to remain.

To grow these plants successfully, it is only necessary to thoroughly dig the ground over to a depth of not less than 12 in., and incorporate with it a good dressing of well-decayed manure, which is most effectively done by a second digging; the surface should then be raked over smoothly, so as to remove all stones and clods, thus reducing it to a fine tilth. The seed can then be sown in lines or patches as desired, the greatest care being taken not to cover deeply; a covering of not more than three times the diameter of larger seeds, and a light sprinkling of fine soil over small seeds, being all that is necessary. A slight mulching of well-decayed manure and a watering with a fine-rosed can will complete the operation. If the weather prove favourable, the young seedlings will usually make their appearance in a week or ten days; thin out so as to leave each plant (if in the border) at least 4 to 6 in. apart.

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## Orchard Notes for June.

### THE SOUTHERN COAST DISTRICTS.

The Notes of last month, referring to the care to be taken in the handling and marketing of all kinds of citrus fruits, apply with equal force during this and subsequent months till the end of the season.

Keep the orchard clean, and work the land to retain moisture. The handling of the citrus crop is the main work in many orchards, but where slowly acting manures are to be given their application should not be later than this month. They should be well mixed with the soil, so that when Spring comes and the trees start a fresh growth a certain percentage of plant food will be available for the trees' use. Heavy pruning should be done now, whilst the trees are dormant. All large limbs

should be cut off close to the main stem; the edges of the cuts should be carefully trimmed, and the whole wound, if of large size, covered with paint or grafting wax, so that it will not start to decay but soon grow over. When the soil of the orchard is becoming deficient in organic matter, the growing of a Winter green crop, such as mustard or rape, is well worth a trial. Clear the crop of fruit from the part of the orchard to be so treated. Plough the land well; work the soil down fine so as to get a good seed-bed, and broadcast the mustard or rape. A manuring of 4 cwt. of meatworks manure and 1 cwt. of sulphate of potash per acre will produce a very heavy crop of green manure, and the plant food not required for the production of such crop will be still available for the trees' use in Spring.

Pineapples and bananas should all be cleaned up, and the land got into first-class order. Pineapples, where at all liable to frost, should be covered with grass or other suitable material. The growth of weeds between the rows of pines on land liable to frost is one of the best ways of encouraging frost, as frost will strike dirty, weedy ground, and severely injure the pines growing thereon, when it will do little, if any, damage where the land is kept perfectly clean—another advantage of cleanliness in cultivation.

### THE TROPICAL COAST DISTRICTS.

Keep the land well cultivated—plough when necessary to bury weed growth, and get the surface of the ground into a state of thorough tilth, as moisture must be retained in the soil by cultivation to mature the Spring crop of fruit. This applies not only to oranges and other tree fruits, but to bananas and pines as well. A good start in Spring means good bunches of bananas and early-ripening pineapples. Heavy pruning can be done now in the case of all trees not carrying a heavy crop of fruit; but where citrus trees are heavily loaded, the pruning should be put off till after the Spring crop of fruit has been gathered. The spraying of the trunks and inside of the trees with the lime and sulphur wash can be carried out, and where Maori is making its appearance the sulphide of soda wash should be used as well.

### THE SOUTHERN AND CENTRAL TABLELANDS.

The pruning of all kinds of deciduous fruit trees is the chief work of the month in the Stanthorpe district. Do not be frightened to prune severely—first, in the case of young trees, so as to get strong well-grown trees instead of staggering top-heavy trees; and, second, in the case of trees that are going off in the size and quality of their fruit. Where peaches, apricots, plums, or nectarines are only making very little growth, and that weak, so that the fruit produced thereon is small, it is advisable to head the tree hard back, so that it will throw out some vigorous branches in Spring that will form a new head for the tree. Apples, as well as plums and apricots, are sometimes inclined to over-produce fruit spurs, which become long and staggering, and bear a large quantity of small-size fruit. A vigorous shortening back and cutting out of such spurs will have a very beneficial effect in the quality and size of the fruit produced.

Gather and burn all prunings; and where codlin moth is present in the orchard, examine the tree carefully when pruning it, so as to see if there are any cracks, crevices, or masses of loose bark in or under which the larvæ of the moth may be hibernating. All larvæ so found should be destroyed, and if the work is carried out systematically it will tend to materially decrease the crop of moths that will hatch out the following Spring.

As soon as any part of the orchard is pruned, gather up the prunings and work the land, as a thorough winter weathering of the soil is very beneficial in its effects; and, further, it will tend to destroy many insects that may be wintering in it. The planting of new orchard or of trees to replace any that may have died, or that have been proved to be unsuitable to the district, may be continued during the month, and right on till the end of Winter.